SEPTEMBER, 1938

ELECTRICAL SOUTH

UNIVERSITY OF FLORIDA

ANOTHER of the South's finest and most successful hotels is the Charlotte, operated under the Bland direction.

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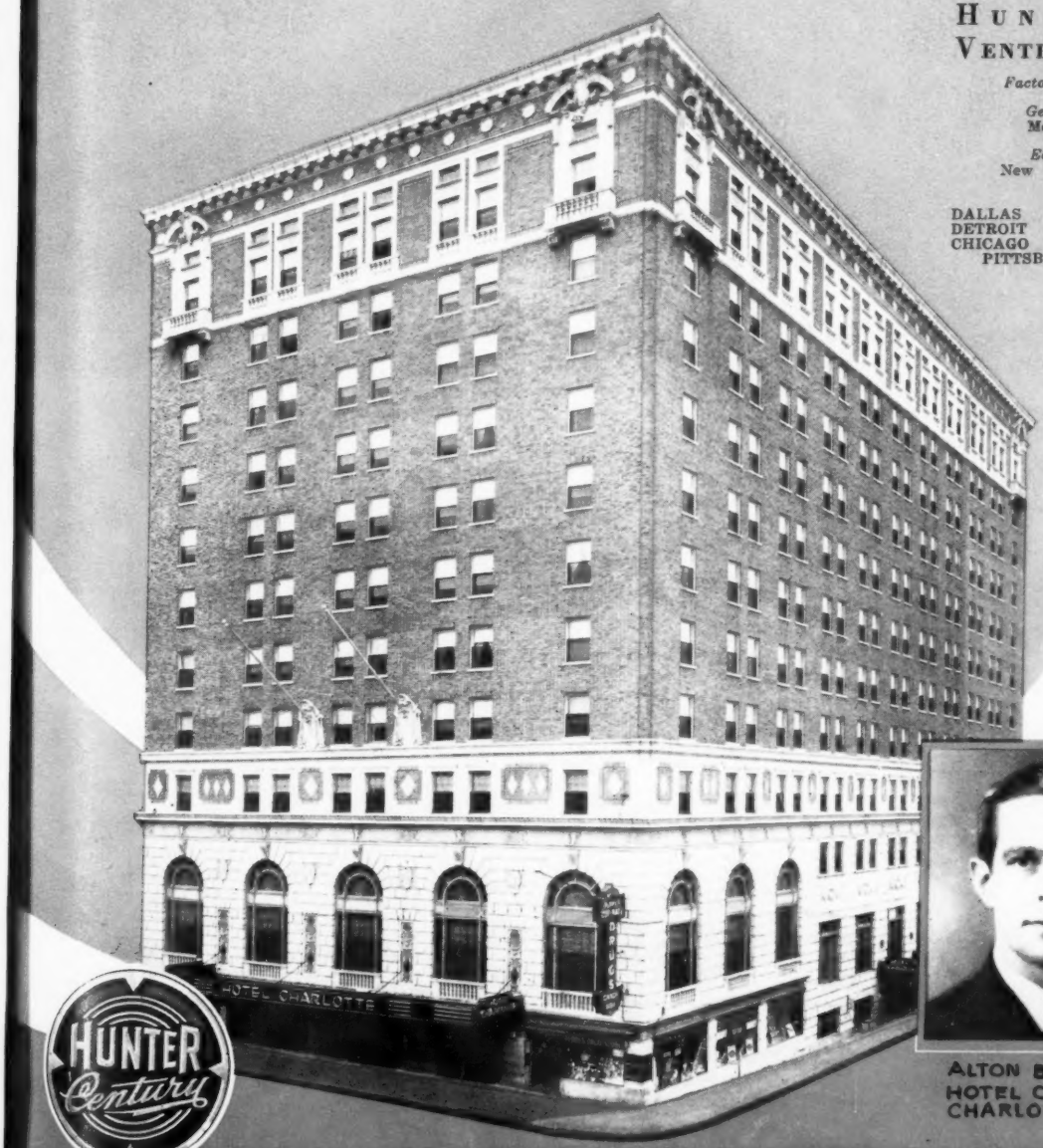

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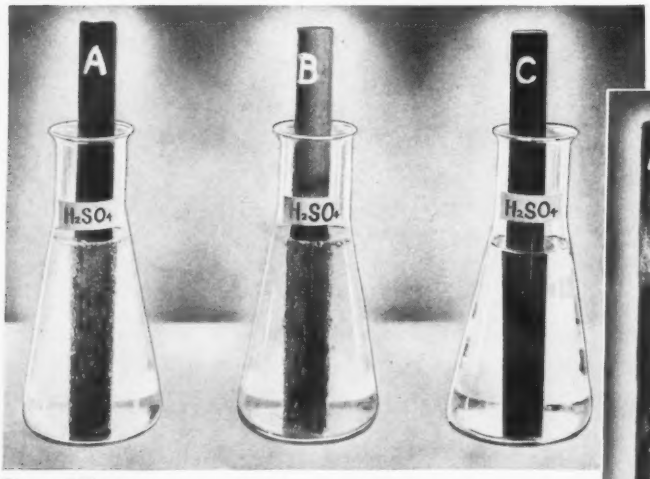
YOUR worst corrosion troubles can now be cured with WALKERIZED DUALCOTE, **the new conduit that resists acids, alkalis, and salt water.**

Compare these Results

after treating three brands of conduit with sulphuric acid for 100 hours.

Samples A and B are high grade galvanized conduits, with the ordinary finishes. Sample C is Walkerized Dualcote.



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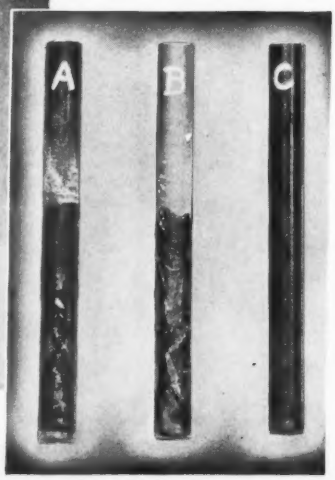

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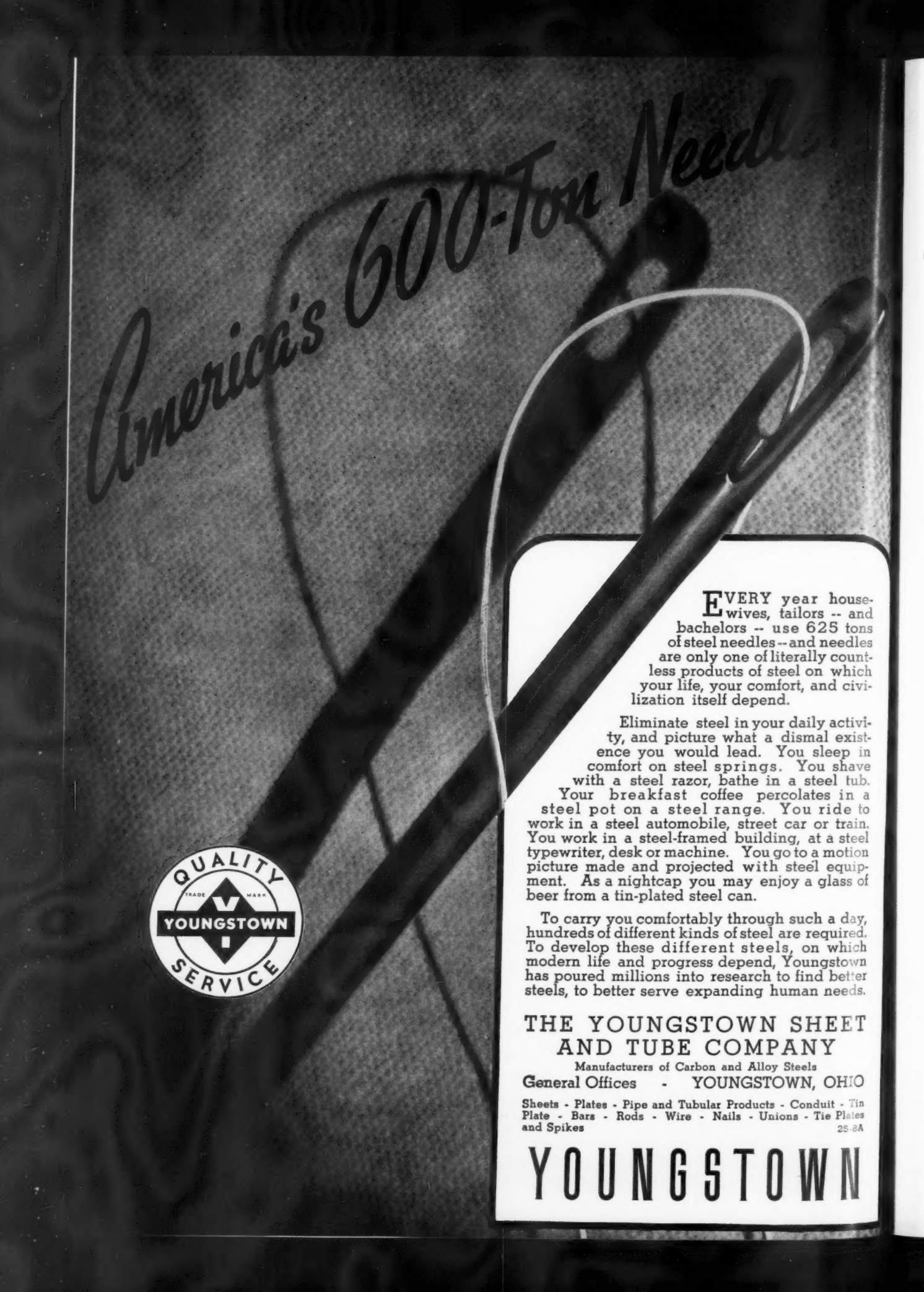

EVERY year housewives, tailors -- and bachelors -- use 625 tons of steel needles -- and needles are only one of literally countless products of steel on which your life, your comfort, and civilization itself depend.

Eliminate steel in your daily activity, and picture what a dismal existence you would lead. You sleep in comfort on steel springs. You shave with a steel razor, bathe in a steel tub. Your breakfast coffee percolates in a steel pot on a steel range. You ride to work in a steel automobile, street car or train. You work in a steel-framed building, at a steel typewriter, desk or machine. You go to a motion picture made and projected with steel equipment. As a nightcap you may enjoy a glass of beer from a tin-plated steel can.

To carry you comfortably through such a day, hundreds of different kinds of steel are required. To develop these different steels, on which modern life and progress depend, Youngstown has poured millions into research to find better steels, to better serve expanding human needs.

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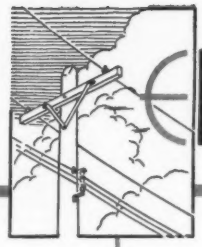
YOUNGSTOWN

SEPTEMBER, 1938

Volume 18 No. 9



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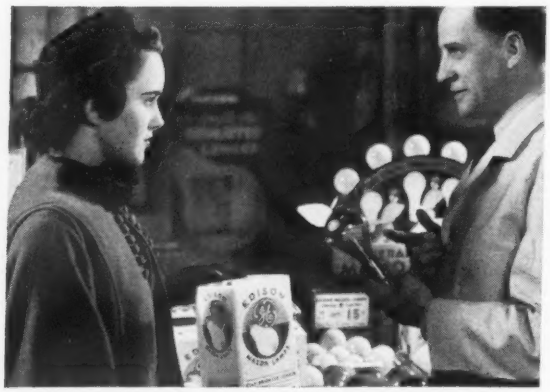
HOW GENERAL ELECTRIC WILL PROMOTE LIGHT CONDITIONING NATIONALLY THIS FALL



G-E Light Conditioning dealers, supplied with special information, materials, and adequate lamp stocks will be specially trained to offer a light conditioning service.

Nine full pages in the Saturday Evening Post, *seven in* Collier's, *and six in* Liberty *will constitute the backbone of the light conditioning advertising campaign.*

Leading newspapers in many of the nation's major cities will serve to point up General Electric's light conditioning campaign in local communities.

GENERAL ELECTRIC plans the biggest promotional campaign in lighting history this fall to develop the principle of Better Light-Better Sight. The theme of this campaign will be Light Conditioning.

POINT ONE in the campaign embraces the creation of "light conditioning dealers" who will be able to recommend the right size bulb for every lighting need . . . and so offer a light conditioning service. They will be developed from enterprising G-E lamp agents who will be given a special course of training to qualify them as light conditioning specialists.

POINT TWO is a concentrated magazine advertising campaign in the *Saturday Evening Post, Collier's, Liberty, American, Cosmopolitan, and Redbook* . . . including 22 full pages within approximately sixty days' time. The full page advertising will start about September 15th and run through the latter part of November.

POINT THREE will be concentrated newspaper advertising campaigns in many of the major cities of the country. These will be planned to coordinate with utilities' own fall lighting campaigns.

* * *

For complete information and detailed ideas on how your own utility can tie-in with this campaign, see the General Electric Lamp Division serving your territory.

GENERAL ELECTRIC

Building for the Future in RESIDENTIAL SALES

By Davis M. DeBard*

Vice President
Stone & Webster Service Corp.

WE ALL know that our residential customers last year bought only 17% of the kilowatt hours we sold. But the facts that interest me are:

1. Those customers comprise 80% of all our customers;
2. They provide more of our revenue than any other class of customers we have;
3. They all bring more grief; they are the basic source of our rate and political interference difficulties.

To be sure, our 260,000 large light and power customers used three times as many kilowatt hours in 1937, but for that we received 135 million less dollars. And, in the last ten years, our gain in residential revenue has been 58% compared with a 29% gain in revenue from large industrial customers. Further than that, we have not begun to scratch the surface of residential potentialities. That is one reason why I am enthusiastic about building for the future in residential sales.

A two-year-old child can push a button and, in perfect safety, have the benefits of all the research of the last four generations. But what good does that do us if all we get, after four generations of selling, is a national average of only 805 kilowatt hours per customer per year. Is there room to grow? I think there is.

What's Wrong With the Industry

We have a business that is already producing a substantial revenue. And we have existing customers in ample number who have not yet been sold the merits of the service we have to offer. The future we face is replete with opportunity. But, we must plan for it if we are to profit by the opportunities it presents. I get the feeling that we are not going about this business in the right way, for two reasons:

1. There are several companies operating in territories with a large percentage of people in the exceptionally low income brackets, yet, they show an average residential use of well in excess of one thousand kilowatt hours annually. On the other hand, there are a large number of localities with an annual usage of well below five hundred kilowatt hours.
2. Attacks that are being made against our industry. There must be something wrong.

During three of the last four summers I have visited the principal countries of Europe. The thing that amazed me most in visiting the homes of the workers, especially in England and the Scandinavian countries, was to find them so appreciative of the service they are getting and their belief that the costs are reasonable. In fact, it is not uncommon to have people say, "Electricity is very cheap in my country but in the United States it is high, I am told."

As a matter of fact, we know that on a comparable basis, in terms of wages earned, electricity is cheaper in the United States than in other countries of the world. Yet, we have not been able to make our people believe that. I wonder why?

Have we been too busy with our research and operating and financial problems to devote sufficient time to the job of selling our customers the *use* of electricity and the great value they receive for their dollars?

Are Low Rates the Answer?

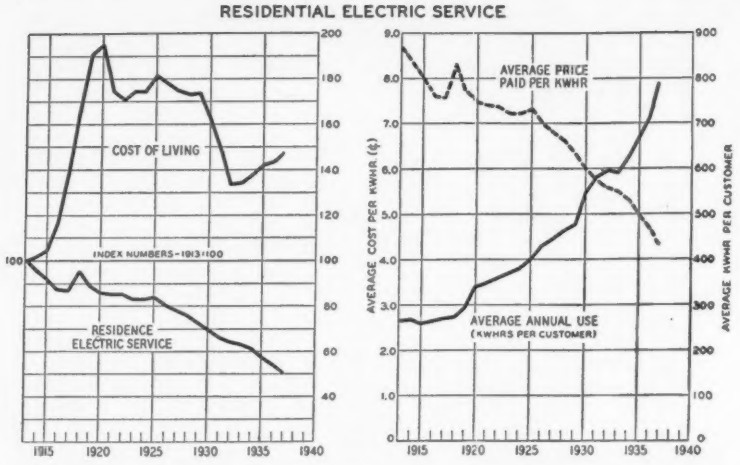
Or, are we too smug in our belief that a continued lowering of rates is the whole answer to satisfied customer relations? Have we perhaps not been too prone to pat ourselves on the back when we made a million dollar rate reduction, when, as a matter of fact, the saving to the average residential customer was seldom more than just a few cents per month? Have we not remembered our beneficience long after the customer has forgotten there even was a rate reduction?

We have sold them gadgets by the million and then all they get is a bill once a month which they think is too high. We sell them appliances and bill them for kilowatt hours. And there is no relation between the two. That is where the trouble lies.

Some day the industry must wake up to the fact that so long as we bill kilowatt hours, we must sell the service these kilowatt hours represent. If we are going to build right for the future in residential sales, there is where we are going to have to mend our ways.

For the future, shouldn't we think more of selling the services as we have sold the power idea in the factory? Certainly, our customers must have more spigots if they are to drink of this great fountain of energy which can be made so much a part of their every-

*Adapted from an address before the Sixth Annual Convention of the Edison Electric Institute, Atlantic City, New Jersey.


RESIDENTIAL ELECTRIC SERVICE
COST OF LIVING
INDEX NUMBERS-1913=100
RESIDENCE ELECTRIC SERVICE
AVERAGE PRICE PAID PER KWHR
AVERAGE ANNUAL USE (KWHRS PER CUSTOMER)
AVERAGE COST PER KWHR (¢)
AVERAGE KWHR PER CUSTOMER
1915 1920 1925 1930 1935 1940

"We have not begun to scratch the surface of residential potentialities . . . Several companies operating in territory with a large percentage of low-income customers show an average residential use well in excess of 1000 kwh. yet many others have an annual usage below 500 kwh . . ."

day lives. But we can't sell those spigots as such. We must sell the convenience, the use and the economy of them.

And, I maintain that ours is the responsibility of promoting the use of those spigots just to hold our own in this business. That is aside from any consideration of increasing our load because there is a grim spectre we have to face called "Load Mortality." Strangely enough, he is not a ghost that haunts us because our customers are dying but because our business is a growing, living, virile thing producing more and more efficient appliances every day. Research and development in manufacturing processes contribute a progressive loss in load for us unless we capitalize on the very factors that produce that loss and go out and sell more vigorously and more efficiently to offset it.

Just to hold our own, with the customers we now have and the appliances they now have, we must do a vigorous job of promoting the use of new spigots to provide for a steady flow of juice. Therefore, our problem of building for the future becomes even more difficult. And what is the answer?

I find it, I believe, in an analysis of the bills of a wide variety of customers. You will not find it in balance sheets, profit and loss statements or in graphs showing gains in revenue, output or numbers of customers. You will find it in spread curves showing the consumption per customer in each bracket from 20 kilowatt hours per month up. When you find, as I am sure you do, that over 70% of your customers use less than 50 kilowatt hours per month, the answer becomes apparent. You have a lot of unsold customers that should be sold more. And there lies the real opportunity for building for the future in residential sales.

Just how you are going to do it in your own locality will vary from the way others will accomplish results. You can probably point to the fact that that same 70% embraces the 70% with incomes of less than $1500 per year. But if you do, I will also point to the fact that it includes most of the 70% that own automobiles and radios.

Sell Use Instead of Kwh

The point is that they are sold on the *use* of automobiles and radios and they are not sold on the use of the excellent, valuable, indispensable service we have to offer them. They think they can get along without it.

Actually, in many instances they could do themselves more good through the benefits of electric service in additional health and comfort in the home than they can by the supposed economies they attempt to effect by doing without it.

We must include in our plans for the future some means of bringing home, particularly to the low income customer, the relative value of additional electric service for his family whether it be extra lighting facilities, a washing machine, or just a new electric clock.

Our customers vary greatly in purchasing power. Spigots should vary greatly in style but be of good quality to serve best the customer and the utility alike. For example, a spigot can be made of silver or of galvanized iron or of cast iron, at varying degrees of cost, but all must be quality appliances rendering good service. We should urge more utility and manufacture research for ways and means to bring our service within reach of that large low income group to an ever increasing degree.

There are something like 22 million wired homes in this country today. Seventy per cent of these make a total of approximately 15 million. These average a use of less than 50 kilowatt hours per month. As a matter of fact, the average for this 15 million is probably not much over 30 KWH per month.

If this group could be induced to use only 2 kilowatt hours more, 10 cents per month in this bracket, the total would amount to 18 million dollars a year. And that would be mostly net because it would require no addition to plant or service. All it would require would be the selling of the *use* of the existing installation and equipment.

In connection with the larger service of this low income customer, we should consider for a moment the matter of rates. Residential rates have been constantly coming down and with them have come incremental rates—until last year, when for the first time, the incremental residential rate increased. Why? Larger use of service by low use customers. What does this mean? It means lower rates and better incrementals, with the result that additional residential load is sold at a better return.

Of course, with those customers we have to consider their problem of capital investment. But we should make it our problem too because it means potential business for us. Take the refrigerator market for example. There are at least 10 million wired homes today that do *not* have electric refrigerators.

Of these, I am assured from actual test surveys, there are 4 million that have a credit standing of $100 or better. With a modern refrigerator requiring only 360 kilowatt hours per year, don't we owe it to these people to find a way of providing them with this health-

(*Continued on page* 52)

Merchandising

IN THIS SECTION:
Next Great Profit Appliance
Radio Dealers Avert Price Cutting
Selling Appliances via the Back Door

October Named "Discovery Month" In Range Program .

SETTING the stage for a Fall boom period in electric range sales, The Modern Kitchen Bureau has placed in the hands of dealers a full kit of sales tools to be used in an aggressive clean-up drive to make electric range owners out of prospects everywhere.

Capitalizing on the tremendous interest aroused in electric ranges and electric cooking by The Modern Kitchen Bureau's 1938 campaign, which has been supported by wide newspaper advertising and publicity, this Fall program, striking a definite cash register theme, will go right into the housewife's kitchen.

Based not on mere ballyhoo, but on facts supported by actual cost of electric range operation, this program is built around the retail salesman, gives him his greatest opportunity to capitalize on strong association support.

Centered around the challenging slogan: "Electric Cooking Costs 1/2 What You Think" this Fall program sets the stage during October—appropriately titled "Discovery Month"—for homemakers who will discover at this time that electric cooking costs are on a competitive basis with those of any other method they can name.

In proof of this, an outstanding, sales-invoking idea in this program calls for retail salesmen to visit homes where electric ranges are in operation—there to get the actual bills that show economy, then use these unanswerable arguments to clinch more sales.

Complete with salesmen's "How to Sell" booklets, colorful window display material that keys in with the "Discovery Month" sales theme, a tie-in newspaper mat service with place for dealer signature, and radio spot announcements, The Modern Kitchen Bureau's array of sales helps is comprehensive, the program well organized all the way.

In addition, manufacturers are preparing for their dealer display material that ties in with this Fall theme. Everything is set for a unified program that will take advantage of the full year's advertising and publicity—hammer home the low cost of operation. October will be cash-in time for electric range salesmen everywhere!

Outlook Encouraging In Washer And Ironer Field . . . . . .

Continued purchasing of household washers in the upper price levels is revealed by the industry figures for the first six months of 1938, as reported by J. R. Bohnen, executive secretary of the American Washer and Ironer Manufacturers' Association.

With the members reporting washer shipments in retail price classes from less than $40 up to $70 and more, the average retail price of all washers shipped in the first half of this year was $73.96, compared to $72.76 in the same period of 1937.

Washers retailing at $70 and more were 37.5 per cent of all those shipped in the first six months of 1938, compared to 40.5 per cent in the same period last year.

Average of retail prices in this class was $102.84 this year, as against $96.30 in the same months of 1937.

Shipments totalled 541,898, compared to 949,328 in the first six months last year. June shipments of 78,354 compared to 84,016 in May and to 143,073 in June, 1937.

Household ironer shipments were 51,349 in the half-year, as against 94,696 in 1937. The June total was 7,046, compared to 6,675 in May and to 14,755 in June, 1937.

Retailers' sales are reported as double manufacturers' shipments.

These winsome homemakers are showing delight over the realization that electric cooking costs are on a par with any other method. The Modern Kitchen Bureau's strong Fall program aims at putting buying smiles like these on housewives' faces.

The Electric Range -

A marketing authority looks at the next great profit appliance

THE next great profit appliance in the electrical industry will be the range. No other electrical appliance today offers the same opportunity for profitable promotion.

What are the facts about the electric range? Nine per cent of wired homes have them; 400,000 were sold last year. Although these figures are not large, as compared with 2,367,000 refrigerators sold in 1937, it is a significant fact that electric range sales registered the largest sales increase, both in 1936 over 1935 and in 1937 over 1936, of any household appliance in the electric field.

Now what are the facts on electric range prospects—facts, rather than wishful thinking. This is a rather dramatic figure: in 1933 only one electric range was sold to each 15 gas ranges; after four years, in 1937, one electric range was sold to each four gas ranges. The electric range is very definitely catching up on competition.

New home building is drawing attention to the electric range. As you go through model homes, you find today that the kitchen is the magnet that attracts Mrs. Home Owner. Go into the kitchen and see what is there. Modernization focuses attention on the kitchen, on the electric range. Of course you have all heard of the work of the Modern Kitchen Bureau, with 160 local bureaus all focusing attention on the refrigerator and range.

By Arthur Hirose*

Director of Research
McCall Corporation

The electric range doubles sales opportunities. Here is a house with an electric refrigerator in the kitchen. That is one sale. You can duplicate that 11,000,000 times throughout the country; in 11,000,000 kitchens in which there are refrigerators you can go into those homes and sell more electric appliances. Right there in the kitchen is a real sales opportunity. The electric range makes it possible to get a second sale in each of those 11,000,000 homes into which we have sold electric refrigerators.

Furthermore, electric range selling makes it possible for the salesman selling the range to get an idea of how soon that refrigerator is due for replacement, and that will become a matter of increasing interest to every dealer and utility. Range sales represent not only sales opportunities in themselves but also sales opportunities in the replacement of refrigerators.

We all know that the electric refrigerator business is highly seasonable: despite everything that has been done there are unfortunate peaks and valleys in refrigerator selling. The electric range appeals

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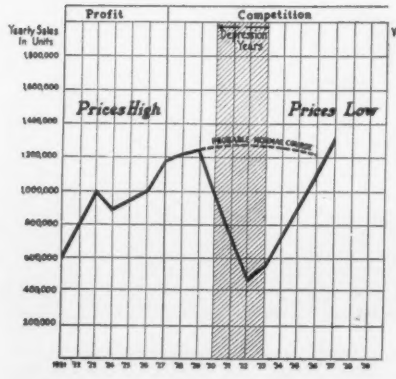
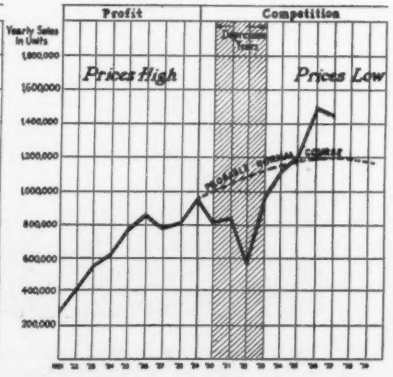
* This is the third of a series of articles based on addresses presented before the Atlanta Electrical Association during a sales training course conducted recently for the benefit of local appliance dealers and their salesmen.

Other articles in the series appeared in the July and August issues for 1938.

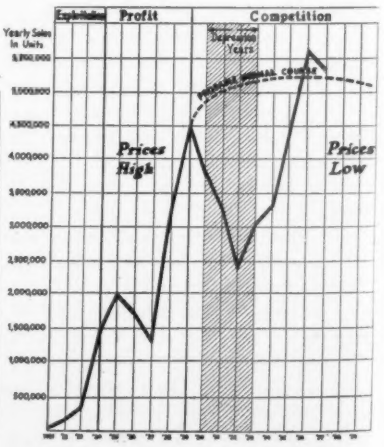
These curves indicate how appliance sales pass through three stages of development: exploitation, profit and competition . . . . .



Vacuum Cleaner Sales History



Washing Machine Sales History



Radio Receiver Sales History

because it can do something to level off those peaks; range sales combined with refrigerator sales makes the major appliance business less seasonable.

The electric appliance industry has changed from ten years ago. At that time we all had many different appliances to sell to Mrs. Consumer, who owned relatively few appliances. Today the picture has changed. We have lower priced appliances to sell; Mrs. Consumer owns far more appliances than she did ten years ago; and she resists replacement sales. Fortunately, she can still be sold a new appliance with the same lure as the refrigerator.

Two frequent questions are: First, are there enough good range retailers to go around? And are dealers and central stations willing to push range sales? It has been estimated that in these United States there are about 19,000 good appliance dealers. We admit 13,000 of these are already selling electric ranges. Fortunately, 6,000 good appliance dealers have not taken up electric ranges, but could do so advantageously.

Numerically, electric range sales suffer by comparison with electric refrigerator sales. But let us consider at what stage in its market development the electric range now stands. We market analysts have a theory that every household appliance goes through three stages: first, exploitation; second, profit; and third, the competition stage.

The exploitation stage lasts as long as eighteen to twenty years. In that period, usually, few homes are equipped with the appliance under consideration, and sales increases are small.

Then, we come to the profit period. This may be as short as from one to eight years, but in that period we usually equip from six to eight million homes with any appliance. Sales increase rapidly, and the trade makes a real profit.

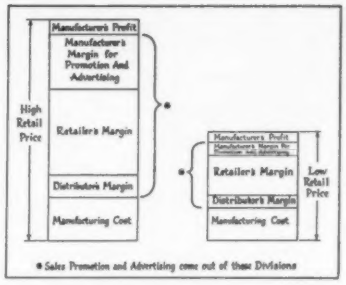
The third stage, competition, runs the rest of industry's life, and during that period we obtain theoretical saturation. Sales of appliances are high in this period, but sales increases have a tendency to decline.

Consider the Vacuum Cleaner

Let's check this theory as it concerns some appliances. Referring to the accompanying charts, look at the sales curve for vacuum cleaners. In the depression period are some years where vacuum cleaner sales dropped. Sales have since risen. That drop and rise is nothing more than the vacuum cleaner business trying to follow the probable normal sales course. We know today that vacuum cleaners are in the competitive stage. Consider washing machines. Again you see an appliance in the third stage of its life. That stage will probably run on and on, but washer profits will be harder to realize.

In the home radio receiver industry we find a case of an appliance exploitation period telescoped within a few short years. As radio men know, the profitable years for radio were very short, and the radio is very definitely in the competition period.

Probably the gas range is also in the competitive stage of its development. Sales increases were large during the past few years, but this was really compensation for poor sales during some previous years. Gas range prices are definitely lower today.



Illustrating how ever-increasing competition eventually forces down a high retail price to a level at which there is little margin for adequate sales promotion . . . . . .

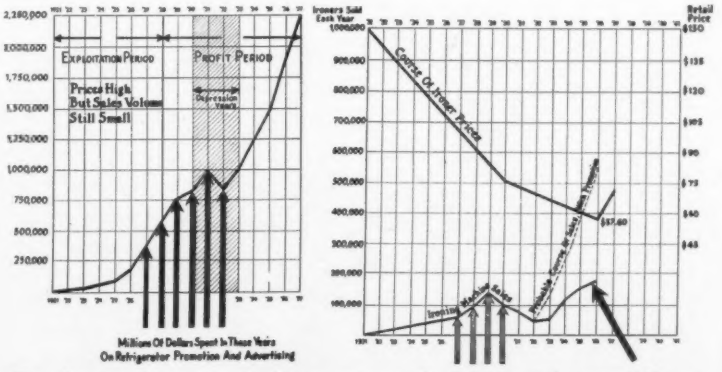
The refrigerator is still in its profit period but pretty soon it may go out of the profit stage into the competition stage. Though sales increase have been large and prices relatively high, refrigerator sales increases are stabilizing, and prices are going lower.

Transition Point Reached

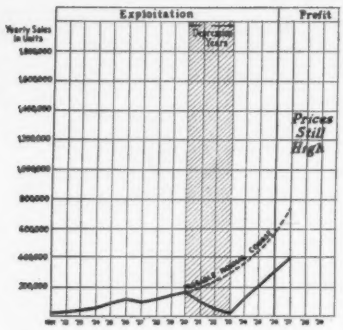
Turn now to the electric range. It seems to be an appliance about to go out of the first trying or exploitation stage. We have filled all requirements for this transition. Two million electric ranges have been sold. And range prices are still relatively high. The range seems about to go into this second interesting profit period and, believe it or not, the electric range has a better sales appeal than the refrigerator.

Let me explain this statement. When electric refrigerators were first promoted in 1926, only half of American families used any sort of food preservation. You had the job of selling women food preservation as well as selling them refrigerators. Although half of American families had never used an ice box at all, you sold 11 million families automatic refrigerators. But in the case of the electric range the facts are more encouraging for we find that 97% of American families already cook. You do not have the job of educating them to cook, only changing the type of fuel they use.

Go back a little into the history of the electric refrigerator business and you will find that six fundamental appeals have sold mil-


Exploitation Period
Profit Period
Prices High But Sales Volume Still Small
Depression Years
Millions Of Dollars Spent In These Years On Refrigerator Promotion And Advertising
Ironers Sold Each Year
Retail Price
Curve Of Lower Prices
$37.60

The electric refrigerator sales history curve at the left shows the remarkable promotional results obtained by spending large sums on advertising at the right time in the development of an appliance. In the sales history curve of the electric ironing machine, shown at the right, the shaded arrows indicate years during which large advertising appropriations might have been expended advantageously. The black arrow indicates that sales have not increased much beyond the 1929 peak and that retail prices have decreased to the point where large scale promotion may no longer be possible.



Electric range promotion has reached the point where it is about to pass from the exploitation stage to the profit stage. Manufacturers, through the Modern Kitchen Bureau and their individual plans, are determined to apply the advertising and promotion necessary to develop the electric range as a "profit" appliance . .

lions of electric refrigerators. First, cleanliness or release from the sloppiness of ice. Second, pride of ownership; manufacturers showed ads of men and women in evening dress saying "Come out into the kitchen and see our new refrigerator." Third, creative urge: the lot of the housewife is rather humdrum, and the refrigerator people said, "You can get release from this routine of plain cooking with an electric refrigerator, you can make fancy ice cream and lots of other intriguing frozen foods." Fourth, health appeal: the refrigerator people talked about "50 degrees" and told women how bacteria would germinate in temperatures above that. Fifth, economy appeal: "Do your shopping once a week when prices are lower and store the food in the electric refrigerator." And finally, the refrigerator people stressed "convenience"; in selling refrigerators, they talked about gadgets and sliding shelves.

Today the refrigerator people are applying these six appeals and are selling refrigerators by the millions each year. But the electric range duplicates each one of these six appeals, and adds some of its own. Certainly it is clean; it has no soot. It appeals to pride of ownership, because it is the newest form of cookery. It appeals to the creative urge; through the range the housewife is assured of new and better cooking results. The electric range is healthful because it is not an oxygen user. It is economical; you can tell a woman she will get the same results every time; certainly, she has less failures and less food spoilage. There is the convenience appeal; no pot watching, time and temperature being controlled.

Then the electric range adds some advantages of its own. Its coolness is marked. It has no flame; no heat to be dissipated into the kitchen. It is safe; pots cannot boil over and put out flames. It saves time; more time for sports, more leisure. And there is always the debatable question of better taste in foods cooked electrically.

Certainly, the electric range meets each of the six appeals that sold 11,000,000 refrigerators, and offers some of its own. Today there are indications of a market more favorable for electric ranges than ever existed for electric refrigerators.

I think before you go into the range business I should remind you that every appliance ever sold has replaced a *less costly* appliance. Electric refrigerators selling at $550 replaced ice boxes selling at $50. When you sold an electric refrigerator at $200, you replaced an ice box that cost about $25. This is a ratio of almost ten to 1. Today, however, you can get an electric range installed for $160, but you would pay $50 for a gas range. So this unfavorable price ratio is not ten to 1, it is nearer 3 to 1.

Refrigeration Promotion Analyzed

What has brought the electric range up to the beginning of the profitable promotion stage? Let's go back and decide what put the refrigerator over. The total number of automatic refrigerators sold in 1927 was only slightly higher than the number of electric ranges installed last year. In 1927, two refrigerator manufacturers together spent about a million dollars in magazine advertising. Two years later each manufacturer was spending a million dollars. In 1927 these two refrigerator manufacturers spent another million dollars in newspapers, and a similar sum each year for the next five years. In this five year period, they spent a quarter of a million dollars in direct mail literature. Each of these two manufacturers yearly spent large sums in trade publications, and about two million dollars a year were spent in sales promotion, dealer helps, contests and things of that sort.

In other words, individual refrigerator manufacturers spent as high as four and five million dol-

(*Continued on page* 50)

(Copyrighted by McCall's Magazine)

Electric cookery is a popular topic in women's magazines today. Articles featuring electric kitchens such as those shown here, designed by McCalls Magazine, will do much to establish acceptance of the electric range.

HERE'S A "GOLDEN HARVEST" FOR YOU, MR. DEALER!

You'll want to share in this bumper crop of profits. Silex now offers an exciting new line of Glass Coffee Makers . . . New, exclusive features . . . A Fall program so thorough and far-reaching, you can reap a "Golden Harvest"!

Remember—Silex is America's depression-proof line! Silex has always dominated the field. Now, with an intensive advertising drive in 53 rotogravure sections, 16 leading magazines and 68 newspapers reaching 52,648,861 homes, Silex will continue to be your biggest profit line. Order today one or both of the Silex deals . . . according to your needs. See your jobber's salesman or write us for further details regarding the "Golden Harvest".

Added Exclusive Features to keep the "weeds" out of your market

No other coffee maker offers you so many important features . . . features that insure enthusiastic acceptance among all your customers.

1. New Graceful Upper Bowl Handle. Unnecessary to touch hot upper bowl.
2. New models . . . redesigned, more graceful, more beautiful.
3. The Famous Anyheet Control . . . standard on all electric models $5.95 and up. Keeps coffee any heat at a turn of the dial.
4. "Quick Cooling" Stoves . . . automatically time infusion period, brewing completed without removing glass from stove.
5. Patented Silex filter that insures clean coffee free of all sediment.
6. Pyrex Brand Glass.

TWO DEALS . . . . wide assortment in each

To enable you to cash in on sales from every type of prospect we are offering two deals. To capitalize thoroughly on the display value and customer appeal of the new Silex line, order both deals. They give you the widest possible assortment of new models. If both deals offer too great an assortment, one or the other deal may be purchased; then supplement either deal you buy with the extra models you need to meet your demands.

GOLDEN HARVEST ASSORTMENT NO. 2

8-cup Delray electric table model, red **$5.25**

12-cup Lido Clear electric table model, black **$6.95**

8-cup Pinehurst electric table model, **$6.95**

8-cup Lido Decorated electric table model, **$9.95**

4-cup Flamingo "Sterno canned heat" model, red **$5.95**

GOLDEN HARVEST ASSORTMENT NO. 1

8-cup electric Delray, black **$4.95**

10-cup Kitchen Range Model, black **$3.45**

8-cup Anyheet Delray, red **$6.25**

8-cup Pinehurst electric **$6.95**

With the units in deal No. 1 you can make up a large assortment of 8 models; with those in deal No. 2, a wide assortment of 9 models.

$5,040.00 WINDOW DISPLAY CONTEST

Still another big "Golden Harvest" opportunity for you to reap extra profits in your own "back yard"! For the best windows featuring Silex Glass Coffee Makers during this big nation-wide drive, we are giving $5,040.00 in cash! Six first prizes, $250 each; 6 second prizes, $50 each; fifty third prizes, $10 each. See your jobber today for full details of contest.

THERE IS ONLY ONE

Genuine SILEX GLASS COFFEE MAKER

TRADE MARK REGISTERED U. S. PAT. OFF.

THE SILEX COMPANY, DEPT. E3 HARTFORD, CONN.

Radio Dealer Organization Averts Price Cutting

By Dwight Abbott

COOPERATVE efforts of New Orleans radio dealers, supported by a generous promotional campaign on the part of public utilities, gave dealers of that city a most successful season during a period when other cities throughout the country were beset with price cutting problems, reports John Eberhardt, who recently succeeded A. Burglass as president of the Radio and Appliance Dealer's Association of New Orleans.

Unusual and business-like work of the association during this period kept all major dealers of the city, as well as distributors, well in line, and brought individual increases in radio sales of as much as 75 per cent.

"So far as we know, this was the only major city in the country that didn't have a price war in radios during the past year," Mr. Eberhardt said.

"The association was organized about six years ago, for improving the business conditions of radio dealers. We haven't exercised a lot of restrictions, and haven't laid down a lot of rules, with penalties for violation. Membership, instead, is more of a sporting proposition. When violations occur, no fines are assessed. The distributor to whom violations are reported is not obligated to act but can act as he sees fit; the case is simply presented to him. He knows, of course, that the weight of membership opinion is against the adverse practice, and this is usually enough to solve the problem."

Committee Watched for Violations

A watch dog committee makes a report to association members at regular meetings held once a month. "Violations" include such derelictions as cutting prices, giving free merchandise with the appliances, or allowing trade-ins other than as prescribed by the distributor.

Only one violation was reported last year which is an indication of the successful operation of the voluntary agreement plan of the Association.

A good deal of the increase in radio sales was due to restored "public confidence" in radios. But this public confidence may be attributed, to a great extent, to the elaborate advertising program carried on for the dealers by the non-radio selling utilities, including the New Orleans Public Service, Inc., and the Louisiana Power and Light Co., according to Mr. Burglass, former president of the Association.

Utilities Gave Assistance

"These companies gave us one hundred per cent cooperation," Mr. Burglass said. "The Public Service Co. had 33 men in the field for 90 days, soliciting business for the radio dealers, at their own expense. Prospects obtained during the canvass were turned over to the Association members.

"The Louisiana Power and Light Company advertised radios in practically every newspaper in the state outside of New Orleans to the same end.

More than $2,000 went into the advertising campaign of New Orleans Public Service, Inc. Dominant notes in advertising copy were the slogan, "Sit in the Orchestra, Instead of the 'Pit' with a 1938 All-Wave Radio," the radio for every room idea, and the importance of the combination short with long wave set.

100,000 Bill Inserts Used

More than 100,000 bill inserts went out to customers of the company. These featured the campaign slogan on a brightly colored slip, with opera accessories, the top hat, cane, gloves and "tickets," as illustration.

Street car cards, exact replicas of the bill inserts, and bulletin boards for outdoor advertising of the same pictorial interest also were used.

IF YOU'RE ONLY A "LIVING ROOM LISTENER"...
you don't know what you're missing.
THERE'S SOMETHING ON THE AIR TO ENRICH EVERY HOUR OF THE DAY
NEWS OF THE DAY . . .
THRILLING SERIAL DRAMAS . . .
FASCINATING, PROFITABLE CONTESTS . . .
FOLKLORE, COMEDY, VERSE AND HOMESPUN PHILOSOPHY . . .
GOOD MUSIC . . .
HELPFUL HOUSEHOLD HINTS
ENJOY THEM WHILE YOU WORK WITH AN
Extra Radio
Share in the Thrill OF FOREIGN BROADCASTS—FLAWLESS RECEPTION AT ALL HOURS—By Short Wave . . .
NEW ORLEANS PUBLIC SERVICE INC.
SEE YOUR FAVORITE RADIO DEALER
BE THERE WITH
SHORT WAVE
LONDON'S CHANGING OF THE GUARD
WHEN GERMANY SALUTES NEW ENGLAND
WHEN FRANCE SPEAKS TO HER DISTANT NORMAN PROVINCES
FOR JAPAN'S EMPEROR'S MESSAGE TO AUSTRALIA
FOR THE DEVOUT'S PRONOUNCEMENTS FROM VATICAN CITY
FOR MOSCOW'S NEWS BROADCAST IN FRENCH OR ENGLISH
It's an easy matter with a 1938 ALL WAVE RADIO
HOME PROGRAMS TOO COME IN BETTER AS YOU WIDEN YOUR LISTENING RANGE AND OVERCOME ATMOSPHERIC DISTURBANCES
FOREIGN STATIONS
AMERICAN STATIONS
Get yourself the BEST
NEW ORLEANS PUBLIC SERVICE INC.
SEE YOUR FAVORITE RADIO DEALER

Newspaper advertisements such as the typical copy reproduced here played an important part in the successful season enjoyed by radio dealers of New Orleans. Both New Orleans Public Service, Inc., and the Louisiana Power and Light Co. gave the dealers splendid support.

If you are interested in A MORE WIDESPREAD and SAFER USE of ELECTRICITY

. . . investigate the FUSTAT!

The long time-lag of the Fustat keeps it from popping out and shutting down the circuit when motors start on washing machines, refrigerators or other such appliances.

This means that a user can keep adding more appliances to present circuits until the load is equal to the approved carrying capacity of his wiring — with perfect safety and without incurring needless blowing.

Prevents hazardous burnout of flexible cords, in spite of long time-lag

The Fustat contains a fuse. The ability of a fuse to protect against dangerous cord shorts, grounded sockets, etc., is well known.

The quick action of the Fustat on such dangerous "household shorts" prevents spraying of molten metal, starting of fires, burning of users.

Protects against dangerous overloading of circuits

An overload even as light as 25%, if continued, will cause the Fustat to open and protect the circuit. Once the right size Fustat is installed permanent overloading is positively prevented.

Keeps the circuit from being robbed of protection

A Fustat cannot be replaced with a penny nor any such substitute — nor with a size too large to protect. In fact sidetracking protection in any way is practically impossible without destroying the Fustat or adapter and thereby clearly showing the user that all protection is gone.

The Fustat guards against anyone unwittingly creating a fire or injury risk thru haphazard practices.

If additional circuits are needed the user cannot readily side-step the issue at the sacrifice of safety.

Reduces loss of time and money on needless "blown-fuse" service calls

When a fuse blows on a starting current everybody loses. The user's service is off . . . the service man may be dragged away from more profitable work . . . the full cost of the call may not be collected if the user kicks about paying it just to have a fuse changed . . . the whole electrical industry loses because needless interruptions of service are costly, annoying and unnecessary. The Fustat stops this senseless waste by eliminating such "false-alarm" service calls.

Fits present fuseholders

Retails at 7½c

Thru the use of an inexpensive adapter that locks in place, the Fustat fits in any standard Edison base fuseholder.

On new jobs, you can specify that panels, switches, etc., be equipped with Fustat bases.

Retails at 7½¢ in 15 to 30 amp. sizes

For safe and trouble-free protection it's just good business to sell, install and use Fustats

The FUSTAT

FOR FULL INFORMATION WRITE TO ANY OF THESE FIRMS

BUSSMANN MFG. CO.	JEFFERSON ELEC. CO.	KIRKMAN ENG. CORP.	NATIONAL ELEC. PDTS. CORP.	UNION INSULATING CO
University at Jefferson, St. Louis, Mo.	Bellwood, Ill.	121 Sixth Ave., New York City	Fulton Bldg., Pittsburgh, Pa.	277 Broadway, New York City

Selling Appliances via the Back Door

SELLING electric appliances by way of the back door on rural lines and in the city is a specialty with the Tri-Cities Plumbing & Electric Supply Company, Sheffield, Ala.

This concern took on appliance selling a few years ago as an adjunct to its electrical contracting business. Now it finds that wiring a house, installing a meter or fixing a leak at the bathroom faucet is just the entree needed for the sale of ranges, waterheaters, refrigerators and washers. The volume of business is divided as follows: appliance sales, 50 per cent; electrical contracting, 35 per cent; and plumbing, 15 per cent.

Here is an example of how the company works its contracting and merchandising business together. When the city of Sheffield recently installed its own electric distribution system, making use of TVA power from Wilson Dam nearby, Dewey R. Robbins, president of the Tri-Cities Company, bid for and obtained the contract to install new meters in the homes, about 1,500 of them. But in bidding in this wiring work, he had appliance sales in mind.

In making the installations, his workmen gained access to all the homes, made a complete inventory of appliances in them, and particularly listed those in the market for appliances as a result of the low TVA rates.

These electricians and helpers themselves sold a number of appliances, receiving a 12 per cent commission for their efforts. Where they were unable to close the sale themselves, they turned in the names of the prospects to a "mop up squad" of regular appliance salesmen. If sales were then closed, the tipsters received a five per cent commission for their trouble.

Nine months were required to install the meters and during that time Robbins' organization sold 60 electric ranges and went considerably over its quota on water heaters, refrigerators and washers. It was the company's best selling year.

At the same time Mr. Robbins turned his attention to the many new rural lines being built in the Muscle Shoals territory. With his organization, he was able to go out and bid on house wiring jobs. Here again it was just the entree he desired for appliance sales. First, the farmers wanted their homes wired, then they wanted electric pumps, and that led to bathroom installations as well as the purchase of electrical kitchen appliances.

Rural Canvassing Profitable

Mr. Robbins has one man with a truck whose business is to work appliance sales on the rural lines. He carries along a selection of appliances in his truck, demonstrating them as he goes along, and calling back to the office where he wants a delivery made. This salesman is selling enough appliances to bring him an average of $200 per month in commissions. In some of the better rural homes he has sold complete electric kitchens. This was made easier by the fact that no electric appliances were owned at all prior to the wiring of the home.

Some of the farmers prefer to go to town and inspect the appliances in the store. Mr. Robbins lives above his store where he has erected a complete electrical kitchen of his own which he shows to his farm customers. In addition to the half dozen appliances in his kitchen, Mr. Robbins has three radios in his home, and his wife uses other electrical servants such as pressing iron, radiant heater and vacuum cleaner. His bill averages $7.41 per month, and he keeps his canceled bills to show prospects.

"We will not have an electrician or plumber working for us who is not a salesman also," said Mr. Robbins. "When a salesman goes door punching, he frequently fails to get past the front door. Our workmen are always welcome because they come to fix the lights or plumbing or to install new equipment. While in the home they have plenty of time to take an inventory of appliances in use and to engage the housewife in conversation as to her needs. Some of them are capable of making sales themselves, especially of such things as fans and base-

(*Continued on page* 18)

The Tri-Cities Plumbing and Electrical Supply Co., of Sheffield, Ala., uses its dual-nature to advantage by employing only sales minded electricians and plumbers. As a result, appliance sales now constitute 50 per cent of the firm's total business. A contract to install 1,500 meters, completed recently, gave the firm a real sales opportunity . . . .

Contracting

IN THIS SECTION:
Electrical Features of Martin Plant
Modern Bridge Lighting
Adequate Wiring in the Kitchen

Program Announced For Contractors' Meeting . .

THE seven business sessions during the four days of the coming National Electrical Contractors' Association convention in Detroit, Sept. 12-15, will be packed full of a program of interest and profit to every electrical contractor.

A study of the tentative program below will disclose the variety and importance of the subjects to be taken up, including as they do some of the most important activities of NECA such as the Voluntary Agreement Plan for Fair Competition, the Code of Fair Buying Ethics, Correction of Price Discrimination Evils, etc.

Among the other items up for discussion are the Rural Electrification Program, Industrial Electrification, Residential Wiring, Contractor-Central Station Teamwork, and one full morning will be devoted to the presentation of new developments and undeveloped available markets which hold opportunity for profitable business for electrical contractors.

The tentative business program is as follows:

Monday Morning

Opening of Convention, Earl N. Peak, Marshalltown, Iowa, president.

Address of Welcome to Detroit, Detroit Convention Committee.

"Your National Association," Laurence W. Davis, New York, General Manager, NECA.

"Fair Buying and Fair Selling," Ralph M. Walker, Atlanta, vice president NECA; chairman, Fair Trading Policy Committee.

"Voluntary Agreement of Fair Competition," D. B. Clayton, Birmingham, executive committeeman, division 5.

Monday Afternoon

"The Dollar Value of Apprenticeship," William F. Patterson, executive secretary, Federal Committee on Apprentice Training, Washington.

"Who Benefits from REA?" John M. Carmody, administrator, Rural Electrification Administration, Washington.

"Wiring the REA Homes and Farms," J. Werner Pyles, head of wiring section of REA, Washington.

"The EHFA Wiring Financing Plan," Henry D. Brite, commercial manager, Electric Home & Farm Authority, Washington.

R.E.A. Conference, Monday Evening.

Tuesday Morning

"Greeting from Our Canadian Neighbors," James H. Turvey, Branford, Ont., president, Ontario Electrical Contractors Assn.; president, J. H. Turvey Electric Co.

"Industrial Cost Plus Jobs," W. A. Millen, Windsor, Ont., president, Millen Electric Co.

"Handling Range and Water Heater Installations on Mass Production Basis," (Speaker to be announced later.)

"Rewiring Programs through Qualified Contractors," W. T. McAuley, Kansas City, Mo., president, Greater Kansas City Chapter.

"Contractor-Central Station Cooperation," John Paul Lucas, sales manager, Duke Power Company.

Golf tournament and visit to Ford Plant, Tuesday afternoon.

Wednesday Morning

Business building symposium, including new developments and opportunities for profitable business for electrical contractors, presented by a group of leading electrical sales engineers.

1. Checking Power Factor.
2. What is an Explosion Hazard?
3. Protective Electronics.
4. Sterilamps and Sterilizing Devices.
5. Silent Switching.
6. Fluorescent Mazda Lamps.
7. Mercury Vapor Lamp.
8. Machine-light Transformers.

Wednesday Afternoon

Union shop section meeting and other sectional meetings.

Annual Banquet, Wednesday Evening.

(*Continued on page* 18)

Dallas Launches Intensive Adequate Wiring Program

A complete and intensive program of wiring promotion was launched in Dallas, Tex., following a dinner meeting held on July 21 in the Home Service Auditorium of the Dallas Power and Light Company. More than 130 representatives of every branch of the local electrical industry attended and an adequate wiring committee was appointed under the chairmanship of Stanley Zercher, of the Graybar Electric Company. P. M. Rutherford, of the utility company, is secretary-treasurer.

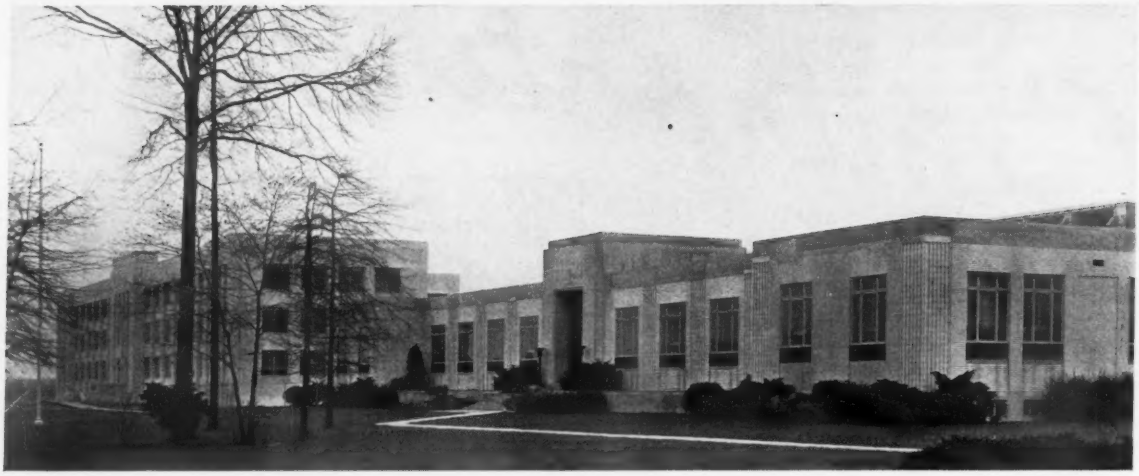
Details of the Dallas operation have been presented in the form of a local plan book. This attractive portfolio contains a comprehensive outline of the national program, its benefit to each branch of the electrical industry and, specifically, the approach to the public, architects, builders and others that will be made under the local set-up.

As the first step, the program will be presented to architects and immediately thereafter to general contractors and builders. A six weeks specification school for contractors and wholesalers' salesmen is being planned.

Mr. Rutherford has advised national headquarters that the Dallas group is interested in applying for a license to certify.

Chattanooga Adopts Wiring Certification Plan . . . .

The Electrical League of Chattanooga recently was licensed by the National Adequate Wiring Bureau to certify wiring installations in its territory that come up to he approved local standard, according to an announcement from national headquarters. Chattanooga is the fifteenth city authorized to operate the certification plan of the wiring program.



Lighting, air conditioning, and electrical service in general, received more than usual consideration in the $3,000,000 plant expansion just completed by the Glenn L. Martin Company, of Baltimore, Maryland.

Adequate Lighting and Air Conditioning Feature Martin Plant Expansion

By J. H. Ignace

BECAUSE of continuous increases in its business, the Glenn L. Martin Company, of Baltimore, Md., one of the world's outstanding aircraft manufacturing organizations, has found it necessary to greatly increase its production and operating facilities. Lighting, air conditioning, and electrical service in general, received more than usual consideration in the company's expansion program which cost approximately $3,000,000.

The company occupies 1,200 acres at Middle River, ten miles from Baltimore. This firm, more than any other single factor, has given Baltimore its preeminence in aviation. It has gained worldwide recognition for its construction of the China, Hawaiian and Phillipine Clipper ships, and the Martin Ocean Transport, one of the world's largest seaplanes. Glenn L. Martin, president of the company, occupies a position of international leadership in airplane design and construction.

The expansion program included an assembly building, a vast structure 450 feet long, 300 feet wide, with a clear headroom of 40 feet under the traveling cranes and without a post, column or obstruction of any kind to mar the enclosed expanse of over three acres. It is built like a bridge with the roof supported by ten trusses, each 30 feet high, 300 feet long and weighing approximately 138 tons. One entire end of the building is a telescoping canopy door, in three 100-foot sections which lift to give an unbroken opening 300 feet wide and 40 feet high.

Lighting Problem Encountered

An outstanding feature of this building is the lighting, designed to provide exceptional working conditions. High bay industrial fixtures are used supplying approximately 30 foot candles on the working floor from 1,500-watt lamps 44 feet overhead. The fixtures are controlled in sets of four, so that light can be localized to any desired part of the huge assembly floor.

An unusual feature of the lighting system for the assembly building is the location of nine transformers on the roof of the structure. Because of the heavy lighting load this was found to be the most advantageous method, each transformer being placed in the section it serves, an area of approximately 100 square feet.

100,000 Sq. Ft. Added

The expansion program also included a three-story engineering building, which houses the engineering, factory planning, and tool design departments, as well as the chemical and physical laboratories. The three floors cover a total area of approximately 100,000 square feet.

Lighting is an outstanding feature of this building also. It is designed to give exceptional working conditions from the standpoint of visual comfort and health. As in the assembly building, the lighting in the engineering building is totally indirect and provides from 30 to 35 foot candles of light upon desks and drafting tables. In this building, 750-watt lamps, 8 1/2 feet overhead, are used. The fixtures in this building are controlled in sets of two, paralleling the windows. The building is air conditioned throughout.

The indirect lighting system featured in the new buildings tends to eliminate eye strain and tends further to bring about greater effici-

ency in work, and to greatly reduce the possibility of errors.

The new lighting is approximately of twice the intensity used in the original buildings, and the system is so designed that this can be doubled if desired, which would permit intensities as high as 60 foot candles.

While the foot candle intensity used ranges up to 35, there is some fine work being done in the engineering building which requires from 50 to 60 foot candles at the present time.

Because of the improvement noted in comfort, safety, increased production, etc., as a result of better illumination, plans are now under way to revamp the lighting throughout the older buildings to bring them up to the standard of the new.

A section of new construction, joining the new assembly building floor to the old factory, houses expanded manufacturing operations, a thoroughly modern air conditioned first-aid hospital, superintendent's office, and a complete lunchroom and cafeteria, also air conditioned. All of these departments are also indirectly lighted.

For air conditioning, the engineering building floors have been divided into four zones which are cooled by two 125-ton air-conditioning units. Each unit takes care of two zones. The system is completely automatic, with separate controls for private offices and general sections.

In lieu of using city water for condensing purposes an evaporative condenser is installed on the roof of the building. This condenser utilizes the same water over and over again, the water being picked up from a pan, after being sprayed against copper coils through which the gas from the refrigerating machines is pumped.

The dry bulb temperature in the building is kept at about 15 degrees lower than the outside temperature. The wetbulb temperature is maintained at a valve giving effective temperatures well within the "comfort zone."

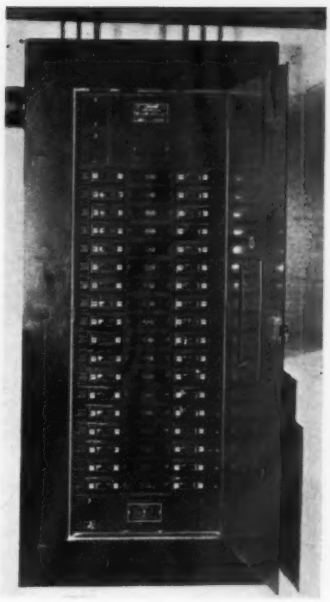
In addition to the two 125-ton refrigeration units for air conditioning the engineering building, the following units have been installed; adminstration building, one 20-ton unit and one 30-ton unit; cafeteria, one 50-ton unit; hospital and superintendent's office, one 10-ton unit.

The assembly building is heated by warm air distributed through ducts extending along both sides and the center of the floor, and the system is so accurately engineered that temperature can be regulated to within 2% throughout the entire space.

All Power Purchased

All power for this vast enterprise is purchased from the Consolidated Gas, Electric Light & Power Company. The power is transmitted to the plant through two 13,000-volt feeders.

The total connected load is approximately 2,833 kw in lighting, 850 kw for electric heating, and 3,550 hp in motors, including refrigeration compressors for air conditioning and blowers on the heating system.



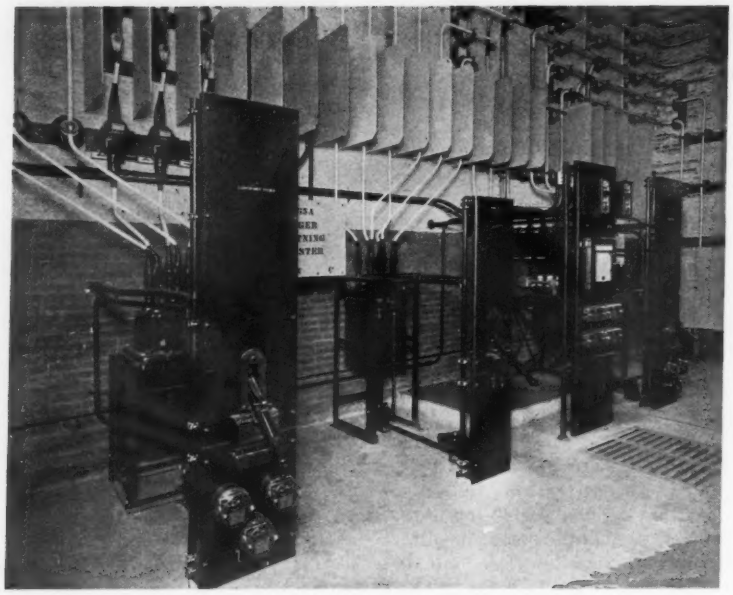
The electrcal circuits and equipment throughout the new plant additions are modern in every respect. A typical circuit breaker type distribution panel is shown here. . . . . .

Use of electricity for heating purposes is quite extensive in the plant. Electric heat is used for blue print drying, for welding, and for high-temperature furnace operation. Five large electric furnaces are employed for laboratory purposes, and for use in the factory for rivet treatment, and heat treating of duralumin parts, steel tools and dies.

The welding department includes electric equipment of several types. The latest addition is a 350-kw. spot welder. It is said to be the largest unit of its kind in the city of Baltimore.

Most of the power load is for fixed location machines. For this a 440-volt service is used. However on the floor of the assembly building where only portable tools are used, it was found necessary to

Indirect lighting is used extensively in the new additions to the plant. The scene in the drafting room of the engineering department shown above is typical of the installations. Illumination intensities vary from 30 to 60 foot candles but all installations were designed for 60 foot candles ultimately. . . . . .



Electrical service at the Glenn L. Martin Co.'s plant is distributed at 13,000 volts by underground circuits. One of the central switching points is shown here. Duplicate feeders to principal load centers provide service continuity of a very high degree. . . . . .

vide means of convenient access to electric service. Service trenches, 25 feet apart and with outlet boxes spaced every 25 feet, are located in the floor. These contain lines carrying 120-240 volt, single-phase power for portable lights, high frequency circuits for high-speed drills, and compressed air to operate riveting hammers and other equipment.

An unusual feature of the electric distribution system installed in this plant is that energy is distributed at 13,000 volts by underground cables to transformers located in the various buildings.

Special switching equipment has been installed in the primary switch house. This installation was designed so that the electric load of the factory can be separated and distributed in several ways from either, or both, of the two incoming 13,000-volt feeders. This installation permits switching from one feeder to another, without interruption of the service.

From this substation, duplicate high-tension lines extend to the original transformer bank which serves the old buildings with power and lighting.

A second set of duplicate, 13,000-volt cables extends to an underground distributing station under the new assembly building. Here is located a second switching installation by means of which any part of the power load in the new addition can be transferred from one feeder to another of the duplicate system.

In a room adjoining the switch gear are located a bank of 333-kva transformers and one 150-kva transformer. These supply low voltage circuits for equipment in the assembly building and for the trench lighting and portable tool circuits.

From this distribution station, also, 13,000-volt lines extend to the nine transformers located on top of the assembly building for lighting, to a bank of six transformers in the basement of the engineering building, and to two transformers in the welding department at one end of the factory building.

The Glenn L. Martin Company employs, at the present time, approximately 3,000 persons. Contracts on hand are sufficient to keep the plant busy for the next two years. The concern produces about three airplanes a week. With the exception of engines, instruments, radio equipment, automatic pilots, wheels and tires, and other items of special equipment, which are purchased from concerns specializing in them, all parts used are manufactured at the Martin plant.

In addition to Glenn L. Martin, officers of the company are: J. T. Hartson, executive vice-president; Harry F. Vollmer, vice-president in charge of manufacturing; B. C. Boulton, vice-president in charge of engineering; M. G. Shook, treasurer; Thomas A. Jones, secretary; and W. W. Crenning, assistant secretary.

In this executive personnel and their associates is represented the pioneering genius, vision, engineering and business ability that has placed the Glenn L. Martin Company in the preeminent and outstanding position it occupies in the aircraft industry of the world.

Selling Appliances Via The Back Door . .

(*Continued from page* 14)

plugs as well as major appliances, but more often they turn the names of prospects over to the office to be worked by regular salesmen.

"We developed our merchandising business during the years when electrical contracting was slack, and we have found that it pays to keep sales minded. Our radio repair man for instance will average $30 a month in commissions above his salary. One of our best sales persons is the young lady who keeps our books. She finds that customers who finish paying bills are good prospects for other appliances.

"Electrical and plumbing work is usually let separately from the main building contract, so our custom is to bid for both, and then use the contacts thus established with the property owner as an entree to appliance sales," explained Mr. Robbins. "Installing a water heater or a stoker for instance usually requires the services of both an electrician and a plumber, so we endeavor to do the whole job and to do it more efficiently than where it is divided between two or three different concerns."

Program Announced For Contractors' Meeting

(*Continued from page* 15)

Thursday Morning

"Pricing Time and Material Jobs," William Hazel, Henderson-Hazel Resale Pricing Service, Cleveland, Ohio.

"It Costs Less to Live Better," C. M. Ripley, General Electric Co., Schenectady, N. Y.

General forum hour; election of executive committeemen: Divisions 1, 2, 5, 8 and 11.

Action on resolutions and recommendations and other business, followed by adjournment.

Frankfort Memorial Bridge Lighting—Model of Modern Practice

By J. O. Schindler

LIGHTING is one of the outstanding features of the Frankfort, Kentucky Memorial Bridge which spans the Kentucky River. Designed by Clark Electric Company, contractors for all electrical work on the bridge, in cooperation with the State Highway Department, the traffic lighting is considered the most modern in the state from a standpoint of efficiency and safety.

Aside from its modern lighting, the bridge is of interest from both a structural and architectural point of view. Its pleasing appearance results from careful handling of line, mass, color and texture; it is a splendid example of symmetry, simplicity and conformity with environment in bridge design.

The main 474-foot continuous span is one of the longest continuous steel deck girder spans in the country. The bridge deck is made of reinforced concrete with a 30-foot roadway and two 6-foot sidewalks. Sidewalks are cantilevered on steel brackets and support the reinforced concrete handrails.

Brilliant lighting effects are attained at the approaches from four luminaires on a 6.6-ampere series street lighting circuit. Two are placed at each approach to the bridge.

These luminaires are of cast-bronze construction with medium density glass panels. Each luminaire contains two 6,000 lumen lamps and extends four feet and nine inches above large concrete pylons located at each bridge entrance.

As such concentration of light is unusual, except on specially designed structures, twelve months were required to produce these hand-made units, which utilized glass with a very high light-transmitting efficiency.

Lighting along the bridge roadway proper is provided by direct illumination from six metal poles spaced approximately 200 feet apart. Mounted on them are Paragon Senior luminaires with Holophane directional refractors, each equipped with a 6,000-lumen, 6.6-ampere clear bulb. The poles are placed along the balustrade, with a lighting center approximately fifteen feet above the roadway.

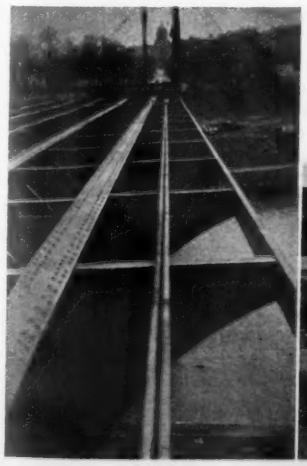
The essential character of each unit is such as to distribute light in the most important directions and to grade it in proportion to the distance the light must travel to reach the surface to be illuminated.

Vertical prisms on the inner surface of the glass in each unit, through proper construction of the outer element, bends the light laterally to produce the candlepower intensity necessary to provide uniform illumination on both horizontal and vertical planes at various points over the bridgeway surface. These units provide an unbroken flood of light extending the full length and width of the structure.

Signal, or navigation lighting, consists of two 360-degree green, mid-channel span lights to indicate channel and clearance. Each of the piers will be marked with four 180-degree red pier lights as required by the United States Lighthouse service. All switching is predetermined and automatically controlled.

The lighting circuit is energized from a constant current transformer located on a pole about 200 feet from the north approach. Two conduits extend down the pole and underground to the bridge. The underground section of the steel conduit runs are enclosed in vitrified tile conduit, jointed with concrete. The tile is then protected by 2 x 12 creosoted timbers.

Hot-dipped galvanized conduit was used for all exposed runs serving the lighting standards. In these runs provision was made for expansion, and elevation was graded for drainage.



The recently completed Frankfort Memorial Bridge, which spans the Kentucky River and is considered one of the best lighted in the state, is shown below. Details of conduit installation are also shown. . . .

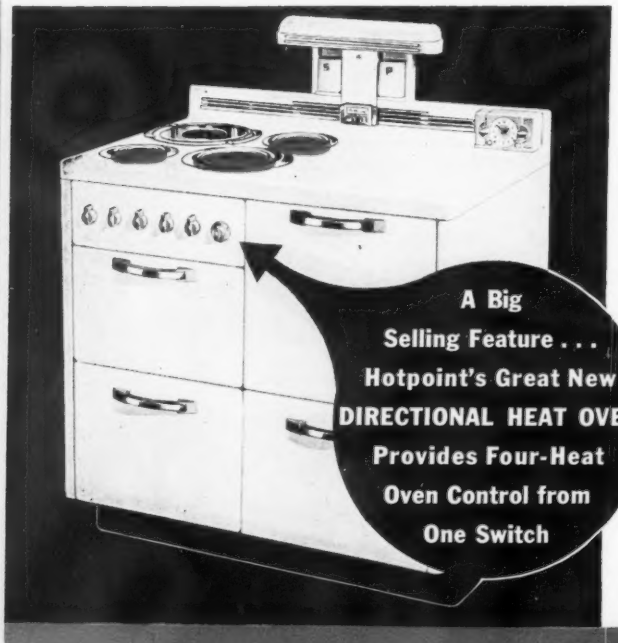
Hotpoint OFFERS 1938's BIGGEST

DISCOVERY CAMPAIGN

OCTOBER . . NOVEMBER . . DECEMBER

These 3 High-Spots Will Help You Sell a Volume of Electric Ranges This Fall

Hotpoint gives you the outstanding range selling feature of 1938 . . . a popular range model that makes women say "I want that," and a timed selling plan to enable you to tie up with the Modern Kitchen Bureau's Big Fall activity "Discovery Month."



1. SELECT-A-SPEED CALR

● Fastest, most economical, most durable electric range surface heatin Five cooking heats from Ultra-High to Low-Warm. Select-A-Speed is a full 8% faster than ever, yet the same unit at Low keeps foods hot for —or completes, at great saving, the cooking of many dishes. And in be these heats are three other cooking speeds that fry, stew and simmer at cost than ever. Calrod effects savings of 20 to 64% in many cooking oper

2. SHERWOOD MODEL

● A big value, 39-inch Hotpoint built-to-the-floor electric range. Many features: Directional Heat Oven gives control of top and bottom heat with one switch, improves baking and roasting results. Other features are Select-A-Speed Calrod, Standard Calrod, Thrift Cooker, Triple-Coat vitreous enamel finish, Hi-Speed Broiler unit. Semi-direct Lamp, Condiment Set and Electric Timer at slight additional cost.

3. FALSE FACE SALES

● Here is the Spark Plug for yo tire Discovery Campaign Range ity for the months of October, N ber and December. This compreh campaign is designed and timed you get electric range orders th It is readily adaptable to your loc ditions and can be put to work minimum of expense. Get you of the Plan Book. Ask your distr or the Hotpoint district represen

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc
5614 WEST TAYLOR STREET, CHICAGO, ILLINOIS

Hotpoint

TOPPORTUNITY FOR PROFIT!

OCTOBER IS DISCOVERY MONTH!

The Modern Kitchen Bureau's dynamic fall campaign will stir up a lively new interest among buyers of electric ranges. Get ready to cash in on this biggest opportunity of 1938.

• Hotpoint is one of the leading range manufacturers sponsoring the Modern Kitchen Bureau's fall activity. The slogan "Discovery Month . . . See for Yourself that Electric Cooking Costs ½ as Much as You Think," will be broadcast throughout the nation during October. Many women in your community will become active prospects. Reap your harvest of range sales this fall. Tie up with Discovery Month by using Hotpoint's Unique False Face Campaign.

YOU HAVE BEEN WAITING FOR A PICKUP IN BUSINESS. IT'S HERE AND THIS HOTPOINT CAMPAIGN WILL HELP YOU GET ORDERS.
LET'S TIE IN THIS HOTPOINT FALSE FACE CAMPAIGN WITH THE BIG DISCOVERY MONTH DRIVE. WE CAN SELL A "FLOCK" OF RANGES THIS FALL.
FALSE-FACE CAMPAIGN
YOU TOO!
SHOULD DISCOVER THE BUSINESS YOU CAN GET WITH THIS PROGRAM
Hotpoint

TIE IN WITH HOTPOINT AND GO PLACES

• Plan now to get your share of profitable range sales. Hotpoint offers you the world's best known, easiest to sell, nationally advertised line of electric ranges, together with a unique plan for action—The False Face Campaign.

The Plan includes novel retail sales stimulators, Newspaper Ads, Folders, Direct Mail, Window Display, Sound Slide Films, X-Ray Visualizer, Posters. Get your copy of this Campaign Plan. It's Free! Ask your Hotpoint Distributor or Hotpoint District Representative.

ELECTRIC RANGES

REFRIGERATORS • ELECTRIC WATER HEATERS • SINKS AND DISHWASHERS • WASHERS AND IRONERS

Adequate Wiring in the Kitchen

THE designer of electrical wiring for the kitchen must think not only in terms of immediate requirements but should also allow a generous margin in the current carrying capacity of circuits for future needs, urges the Modern Kitchen Bureau in its new publication "Electric Kitchens and How To Plan Them." (The booklet, designed as an aid to architects, builders and others concerned with kitchen planning, contains helpful information on all other phases of kitchen planning as well.)

Continuing its discussion on adequate wiring for the kitchen, the booklet emphasizes that in addition to ample and conveniently located outlets at the several work counters, special outlets should be provided for certain items of equipment. The electric refrigerator requires its own outlet. If there is a ventilating fan, it must have its own specifically placed outlet. As a minimum there should be at least three convenience outlets in the kitchen.

Three No. 6 wires should be carried to the range location and terminated at wall or floor in a heavy duty polarized range receptacle or other means in accordance with the local regulations.

Water Heater Circuits

The electric water heater usually requires a circuit of its own. If special off-peak rates, available in many sections, are in effect, the details of such circuits should be determined by consulting the local electric company. Where special rates for water heating are effective, the service rules of the local utility may require omission of disconnecting switch or provide for special wiring for the heater.

Provide separate circuits for lighting and the service outlets. To the latter circuit it is generally acceptable to connect ventilating fan, clock, radio and all outlets for portable appliances. Local Electrical Codes and Ordinances should, of course, be followed where these recommendations conflict.

Utilities often have their own specifications for installation of ranges and water heaters.

Main circuits, other than those specifically discussed, should be of wiring not smaller than No. 12 with fuses or circuit breakers of 20 ampere capacity.

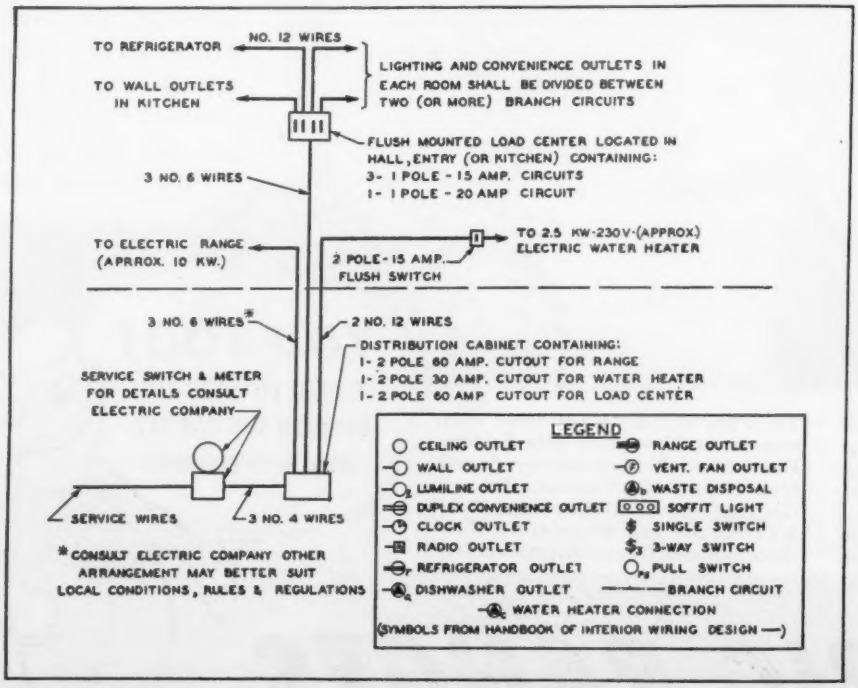
Good Illumination Essential

Good illumination is one of the prime essentials in the modern kitchen. It requires adequate intensity and proper placing and diffusion to avoid both shadows and glare. For the average kitchen general illumination may be provided by a 150-watt bulb in an opal glass or semi-indirect type of central ceiling fixture. Auxiliary lighting units are needed over the sink and may be placed over one or more of the working counters. Recessed fixtures, placed behind opal glass covers for use in the soffit fixture over the sink are available in sizes 10″ x 10″, 10″ x 24″ and 10″ x 36″. Several cabinet manufacturers will also include a recessed light on the underside of wall cabinet if so desired. Bracket types of fixtures, such as here illustrated, are also suitable.

Range Lighting

A source of illumination is often needed over the range and many modern electric ranges are equipped or may be so equipped by the manufacturers.

The central fixture should be operative from either of two switches, one near the dining-room entrance and one near the service door.


TO REFRIGERATOR
NO. 12 WIRES
TO WALL OUTLETS IN KITCHEN
LIGHTING AND CONVENIENCE OUTLETS IN EACH ROOM SHALL BE DIVIDED BETWEEN TWO (OR MORE) BRANCH CIRCUITS
FLUSH MOUNTED LOAD CENTER LOCATED IN HALL, ENTRY (OR KITCHEN) CONTAINING:
3- 1 POLE - 15 AMP. CIRCUITS
1- 1 POLE - 20 AMP CIRCUIT
3 NO. 6 WIRES
TO ELECTRIC RANGE (APPROX. 10 KW.)
2 POLE - 15 AMP. FLUSH SWITCH
TO 2.5 KW-230V-(APPROX) ELECTRIC WATER HEATER
3 NO. 6 WIRES*
2 NO. 12 WIRES
DISTRIBUTION CABINET CONTAINING:
1- 2 POLE 60 AMP. CUTOUT FOR RANGE
1- 2 POLE 30 AMP. CUTOUT FOR WATER HEATER
1- 2 POLE 60 AMP CUTOUT FOR LOAD CENTER
SERVICE SWITCH & METER FOR DETAILS CONSULT ELECTRIC COMPANY
SERVICE WIRES
3 NO. 4 WIRES
*CONSULT ELECTRIC COMPANY OTHER ARRANGEMENT MAY BETTER SUIT LOCAL CONDITIONS, RULES & REGULATIONS
LEGEND
CEILING OUTLET
WALL OUTLET
LUMILINE OUTLET
DUPLEX CONVENIENCE OUTLET
CLOCK OUTLET
RADIO OUTLET
REFRIGERATOR OUTLET
DISHWASHER OUTLET
RANGE OUTLET
VENT. FAN OUTLET
WASTE DISPOSAL
SOFFIT LIGHT
SINGLE SWITCH
3-WAY SWITCH
PULL SWITCH
BRANCH CIRCUIT
WATER HEATER CONNECTION
(SYMBOLS FROM HANDBOOK OF INTERIOR WIRING DESIGN —)

This wiring diagram for a typical electrical kitchen is an example of adequacy and provision for future requirements. It is reproduced from a booklet entitled "Electric Kitchens and How To Plan Them" issued recently by the Modern Kitchen Bureau. . .

Engineering

IN THIS SECTION:
Low Cost Cure for Radio Interference
Advantages of System Planning
Lightning Arrester Testing Routine

Lighting Voltage Trend Is Upward

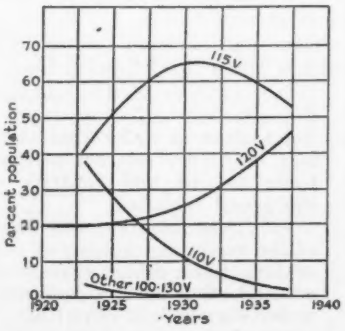
ACCORDING to a recent analysis of central-station voltages for lighting by G. S. Merrill, of the General Electric Company, general voltage levels have been steadily improving throughout the country.

The following tabulation shows the approximate per cent of the population of the United States supplied at standard distribution voltages of 110, 115, and 120.

Per cent of U. S. population in areas supplied at different voltages

Voltage	1923	1928	1933	1936	1937
110	36.3	15.9	5.2	2.0	1.8
115	40.9	61.6	61.7	58.9	52.1
120	19.4	22.4	33.0	39.0	46.0
All Others	3.4	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0
Average voltage (1st 3 items)	114.1	115.3	116.4	116.9	117.2

It is interesting to note that the average level has been steadily improving, since 1923, while during the last five years, the 120-volt level has been gaining at the expense of the two lower voltages.



The accompanying chart graphically portrays these trends.

The availability of efficient low-cost regulating equipment for all parts of the circuit has doubtless contributed largely to this recent improvement in electric service. As more and more operators become "voltage-conscious," it is expected that a still greater number of systems will adopt the 120-volt level as giving the best service for lighting loads.

Low Cost Cure For Radio Interference.

CULMINATING ten years of dogged research, a new glaze and simplified processing method is being installed in Westinghouse's two porcelain plants for making all insulators manufactured free from radio interference at the same price as now paid for ordinary insulators.

Since the introduction of a-c receiving sets, the persistent complaints of radio owners has focused attention on a difficult public relations problem for power companies and industrial plants because conventional high-voltage pin type insulators frequently generate radio interference at line and tie wires.

Although the general public has been critical of noises generated on power lines, the public utility has heretofore been faced with increased cost of lines if they were to be made radio interference proof. This new development, however, makes it possible to build lines free from noise generated at the insulator at no greater cost.

Research studies have shown that the radio disturbance caused by line insulators of all sizes, is due to minute arcs created at the point of contact of conductor and tie wire with the insulator by the normal flow of insulator charging current. While the flow of charging current is inherent in any insulator, it was discovered that the arcing could be eliminated by proper distribution of voltage stress and the introduction of the charging current into the insulator without forming corona.

Having found the cause of interference, Westinghouse developed a copper-oxide glaze as an integral part of the insulator as early as

(*Continued on page* 25)

Radio interference from these typical pin type insulators is prevented because of a newly developed copper-oxide glaze, so effective and easily applied that these radio-proof Westinghouse insulators cost no more than ordinary ones. Previously, on certain insulators, radio proofing represented half the cost. The coating maintains good contact between conductor tie wire, and insulator; and provides a conducting surface over the top shed of the insulator.

System Planning

IN a previous article which appeared in the June 1938 issue, Mr. Stone discussed the advantages of system planning and the basic principles for establishing a master plan. In this concluding article, he suggests that the greatest possibilities for improvement will be attained through the closest possible adaptation of the power system in all of its parts to the service which it must render.

(Copyright, Blank & Stoller)

By E. C. Stone
Vice President and General Manager
Duquesne Light Company

THE advantages of system planning come from the application of the principles of the master plan to the step-by-step development of the system rather than from the details of the plan. Long range forecasts of the future are never accurate and it is inevitable that conditions that actually develop will necessitate frequent changes in the details of the plan.

The principles of the plan, such as scheme of connections, standard voltages, standard capacities, control of short circuits and so on, if properly worked out, will hold good until advance of the art make better ones possible notwithstanding the change in details, and the result will inevitably be the attainment of more system capacity per dollar of investment than would otherwise be had in additions to the system, and a longer and more useful life for the investment after it is installed.

Evidence of the flexibility of application of a master plan was disclosed recently in the writer's own experience. Changed conditions necessitated a change in the proposed location of a new major plant from a point some thirty miles from the center of the present system to a point only three miles from the center.

Although the details of the system diagram were radically changed thereby, the principles of the master plan were not altered in any way, and no part of the system that had already been installed under the plan was made inadequate or uneconomical.

A Continuing Process

The development of the major plan is a continuing process; the principles established are based on the state of the art at the time they are set up. As the art advances and new lines of equipment are developed, it becomes desirable to set up new principles to take advantage of these advances.

Within the past decade, 66 kv and 132 kv cables have revolutionized power transmission in congested built-up city districts; the low voltage network protector has made possible an entirely new system of power distribution; and recent improvements in circuit interrupting devices have made further radical departures possible. Knowledge of the behavior of lightning and improvement in lightning arresters have revolutionized the reliability of overhead lines within a few years.

Even now many of the complications, difficulties and costs of power distribution come from the necessity of providing insurance against insulation failures. Rapid strides are being made in this field and the future outlook is most favorable. If insulation failures did not have to be expected and provided for, system design would be based on radically different principles from those now in vogue.

So as the art advances it is inevitable that there will be changes in the fundamental principles of the master plan. Such changes, however, will only be made when they will result in worthwhile improvement to service or savings in cost, and if adopted will be applied in such a way as not to invalidate previous investments except, of course, where replacements can be shown to be justified because of sufficient reduction of operating and maintenance cost to cover the fixed charges of the new equipment.

Planning Engineer's Objectives

As stated above, the major objective of the planning engineer in the future will be to obtain the greatest possible capacity for each dollar spent in the development of the power system.

In summarizing, it is suggested that the greatest possiblities for improvement will be found through constant attention to bringing about the closest possible adaptation of the power system in all of its parts to the service which it is called upon to render.

This will involve particularly studies along the following lines:

(a) Analysis of the peak load characteristics of every part of the system in order that there may be proper relation between loads carried and capacity of equipment installed.

(b) Determination in detail of the maximum capacity of generators, lines, cables, transformers and other system equipment under various load conditions, in order that the most economical size of equipment may be used in every instance.

(c) Intensive analysis of causes of interruptions to service in the various parts of the system and determination of the relative part played by the different elements of the system in contributing to interruptions.

(d) Intensive study of the reliability of the lines and apparatus in the power system and determination of the probabilities of failure, to be used as a basis for the requirements as to spare capacity and duplication of system parts.

Looking into the future it seems fair to assume that further advances in our knowledge of the hazards of operation, such as lightning, insulation failures and so on, as well as improvements in the service reliability of equipment, will make it possible to substantially increase the loads which can be carried safely on our existing power systems and will greatly simplify the design of the power system in the future.

Louisiana Utility To Extend Transmission Lines . . .

Construction of a high tension electric line from Standard, Louisiana, to Natchez, Mississippi, entailing an expenditure of more than a half million dollars was announced recently by McGregor Smith, president of the Louisiana Power & Light Company.

Work on the new project will start immediately and will make the utility company's expenditures for new construction well above one million dollars for the year.

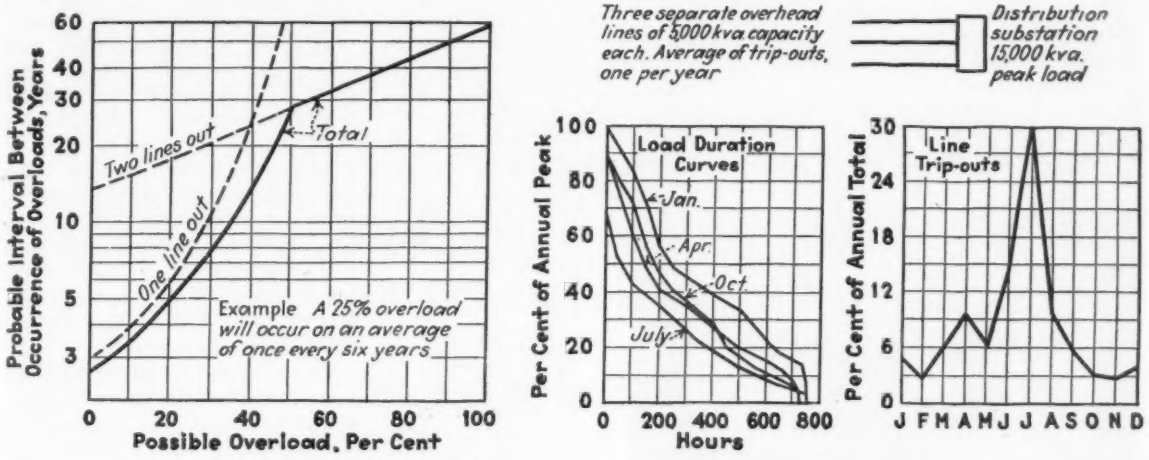
The power company will rebuild its present 16 miles of 110,000 volt highline from its Sterlington Steam Electric Station to Standard Substation; will install additional circuit breakers and switching equipment at the Standard Station; and build 53 miles of highline to a point on the East bank of the Mississippi River opposite Natchez where it will erect a 560 foot steel tower on which its conductors will cross the river.

Low Cost Cure For Radio Interference

(*Continued from page* 23)

1930. Although continuously improved and proven successful under all operating conditions, now for the first time are radio-interference-proof insulators offered as a standard product carrying no price premium.

Example of Use of Probability Data in Preparing System Plan



THE major objective of the planning engineer in the future will be to obtain the greatest possible capacity for each dollar spent in the development of the power system. This objective can be attained partly through intensive study of the reliability of the lines and apparatus in the power system and determination of the probabilities of failure, and through the utilization of these data as a basis for the requirements of spare capacity and duplication of system parts.

As an example showing how the probability of overload could be studied in the case of a large substation supplied by overhead transmission, Mr. Stone refers to a study made by Walter L. Lyman, electrical planning engineer, Duquesne Light Co., entitled "Fundamental Considerations in the Preparation of a Power System Master Plan."

The case selected is that of a hypothetical distribution station with a peak load of 15,000 kv.-a. supplied by three high tension lines of 5000 kv.-a. capacity each. These lines are each three miles long over different routes and, as shown by experience, may be expected to trip out on an average of once a year. The average length of outages has been 30 minutes, and in only 10 per cent of the cases do they run over two hours. These outages are due mainly to lightning occurring during the summer months.

Experience is again consulted to show the normal seasonal variation in trip-outs. In direct contrast to this condition is the fact that the peak loads are much smaller in the summer. An analysis of the hourly, daily and seasonal variations in load shows that while the January peak is 15,000 kv.-a., the peak in July is only 10,000 kv.-a., and that thoroughout the year the load exceeds 10,000 kv.-a., only 11 per cent of the time.

Although a line outage at the time of the station peak would produce a 50 per cent overload on the two remaining circuits, it is very improbable, since most of the few hours during which the load exceeds the capacity of two lines occur during the seasons when lightning is infrequent or absent. These fundamental factors have been combined to show the probability of having overloads of various magnitudes and the results shown.

The probability of overloads due to simultaneous outages of two lines is also shown. Although the possibility of this at the time of the peak can be imagined, it is too remote for much consideration. With the three lines spaced an average of one-half mile apart, experience shows that in only one case in 15 will two circuits be out together. And only 37 per cent of these would occur when the load is over 5000 kv.-a. (once in 13.5 years).

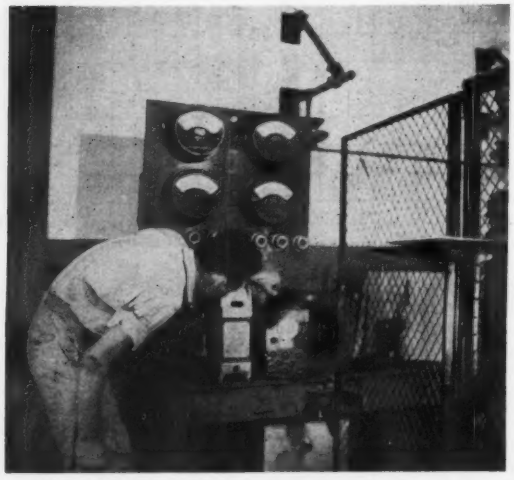
Lightning Arrester Testing Routine Indicates Defective Units

By Lloyd E. Smith

Electrical Laboratory
Tennessee Electric Power Co.

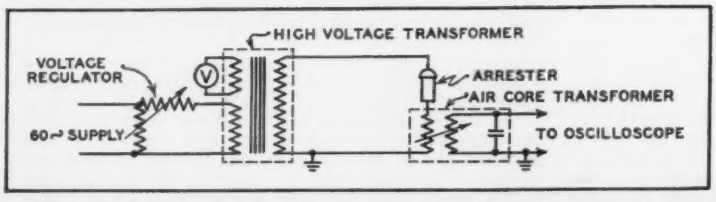
SEVERAL methods have been devised for testing lightning arresters in the laboratory. The gaps may be tested by applying voltage to the arrester terminals of sufficient magnitude (usually at a frequency of 60 cycles) to arc over the gaps, using some means to prevent the maintenance of the arc; or a surge generator may be used to test the overall performance. These two tests will give a good indication of the ability of the arrester to drain a surge voltage from the line, but they do not give a reliable indication of whether or not the arrester will prove to be a nuisance when installed by causing radio interference. Some test should be given the arrester which would show the existence of this defect.

The first logical suggestion for a radio interference test would be to use a radio near the arrester test set-up. This method was used for a number of years by the Tennessee Electric Power Company. However, as in most laboratories similar to ours, the noise level is so high that the arrester under test adds but a slight amount to the total noise. The test radio is also distracting to those not interested in the test. For these reasons a visual method of detecting radio interference was developed for use in conjunction with the 60-cycle voltage breakdown test.



Equipment set up for test of lightning arresters is shown here in the laboratory of the Tennessee Electric Power Co.

Perhaps it would be well to analyze the cause of radio interference by lightning arresters, in order that the reasons for each step will be clear. Note that a 60-cycle noise will not radiate from the transmission line. The noise heard in the radio is a high frequency "carrier wave" generated by the arc and modulated or interrupted 120 times a second. The radiated energy is at this high frequency and will not exist if there is no arc. There is always some charging current flowing in any arrester circuit, as can be noted when an arrester is disconnected from an energized line. This charging current is at 60 cycles only and does not cause radio interference.



This diagram shows the equipment connections for the oscilloscope type of test on lightning arresters to determine general condition . . .

The description of the test for radio interference using the cathode ray oscilloscope in conjunction with an air core transformer with a tuned secondary, which has been in use successfully for the past two years is shown in the accompanying diagram.

The oscilloscope is set on a timing sweep of 60 cycles, using as small a synchronizing voltage as possible. The oscilloscope will show the instantaneous voltage across the secondary of the air core transformer, induced by current flowing through the primary.

The oscilloscope circuit is so designed that a greater response is obtained from a unit current at a high frequency than from the same unit current at 60 cycles. Normally, therefore, the leakage does not cause an appreciable deflection of the cathode ray beam, below the breakdown voltage of the arrester. However, an extremely high 60-cycle leakage will give a deflection before breakdown. When the voltage is raised high enough to cause breakdown of the arrester gaps, a current will flow that has a large component of 60-cycle as well as high frequency current. If this high frequency current flows before "breakdown" it will be clearly indicated on the oscilloscope screen as short period oscillations, clearly distinct from any 60-cycle leakage current.

It is this high frequency current modulated at 60 cycles which causes radio interference. This must occur at or below line voltage to give

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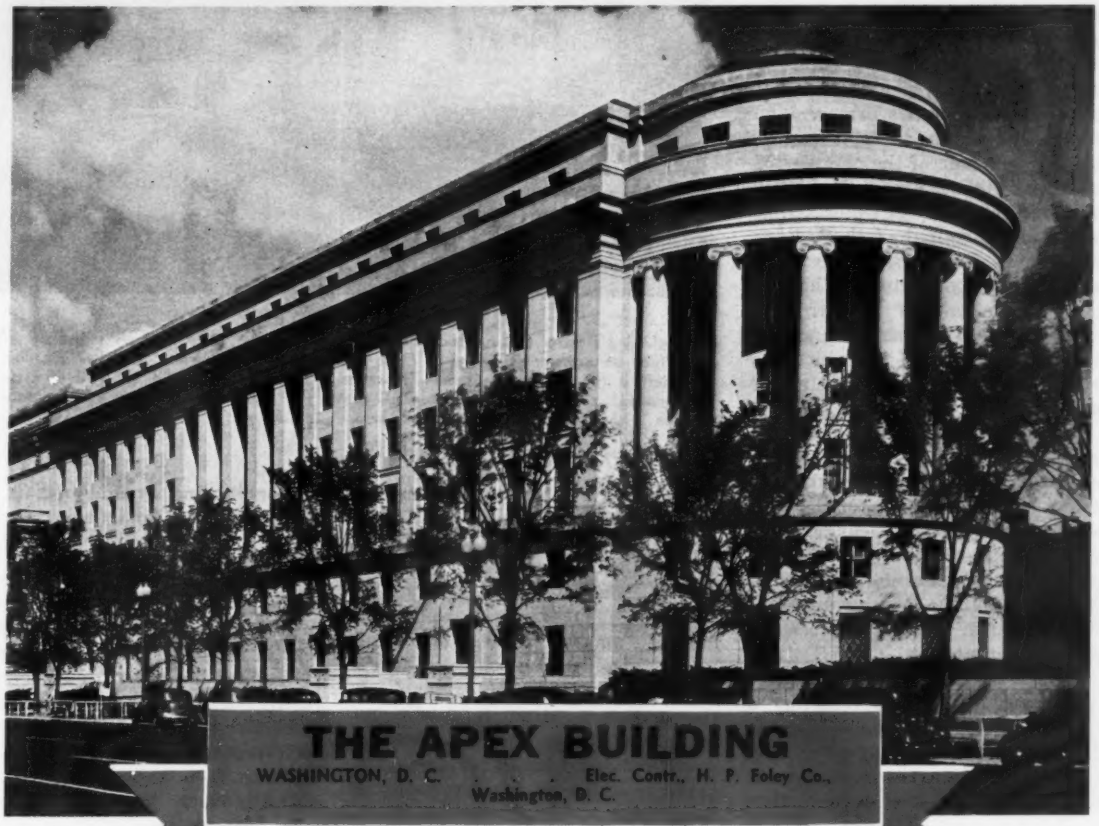

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trouble while in service.

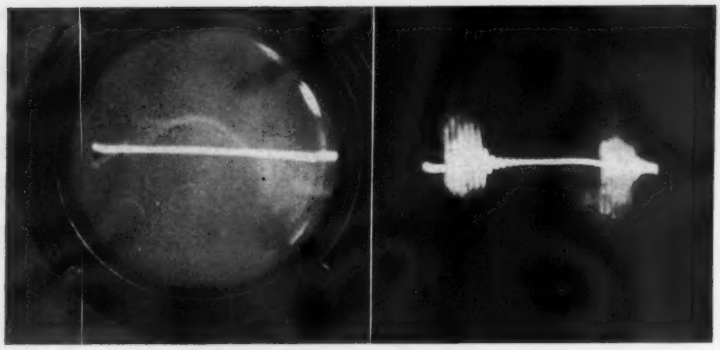
The actual test routine follows: The arrester is mounted in a vertical position inside the test enclosure. The top lead of the arrester is connected to the high side terminal of the testing transformer. The bottom lead of the arrester is connected to one side of the primary of the aircore transformer. The other side of the primary is connected to the ground terminal of the testing transformer. The oscilloscope vertical plates are connected to the secondary terminals of the air core transformer. The oscilloscope potential is thus kept very close to ground potential as a matter of safety.

Voltage is then applied to the arrester gradually with the voltage regulator; it should never be applied suddenly. There should be no indication of 60-cycle leakage current, and there must not be any high frequency leakage current at the rated voltage of the arrester. An arrester in good condition will arc over at about 1½ to 2 times rated voltage. This rated voltage is higher than line voltage as a rule, which gives about two to three times line voltage for arc-over. On a good arrester, there will be no high frequency current flow until the instant of arc-over, when there will be a large increase of 60-cycle current as well as high frequency current.

If there is a high frequency flow at any voltage under 110 per cent of line voltage, the arrester under test can be expected to give radio interference if placed in service and the defective unit should be discarded.

Gap Spacing Tested By Arc With High Voltage

As a test to determine whether the gaps have too wide a spacing for arcing over when a surge hits the protected line, the gaps are then arced over under test. As stated before, some means should be provided to limit the current taken by the arrester since it is not designed to carry dynamic (60-cycle power) current for an extended period. One manufacturer recommends limiting the current to 30 milliamperes for no more than three seconds. Lightning arresters are tested in our glove test enclosure, which has relays installed in the high side of the testing transformer to trip the supply breaker when 25 milliamperes flow in the protected circuit.



A lightning arrester test method utilizing an oscilloscope gives a visual indication of whether an arrester is likely to cause radio interference when actually installed. At left is the oscilloscope screen shown at the instant of breakdown with 60-cycle component super-imposed on zero line. At the right is the typical appearance when high-frequency current flows before "breakdown." . . . . .

The practice of this company has been to test only those arresters which are suspected of being bad, and occasionally those removed from discontinued or rebuilt lines. Heretofore no attempt has been made to make a general electrical inspection of arresters since every past scheme required removal of the arresters or at least disconnecting from the line. However, a modification of the laboratory test using a split-core transformer has been tried in the laboratory with promising results, and in the immediate future this set-up will be carried into the field for a general inspection of arresters in service.

Results of Tests

To obtain some idea of the frequency of rejections of the arrester's tested on suspicion of being bad, the following data are given:

3 kv Arresters

	Condition Indicated Good	Bad
Number Tested	38	15

7½/15 kv Arresters

	Condition Indicated Good	Bad
Number Tested	64	17

It is rather difficult to weigh the results since no records have been kept of the exact reason for removal and test. The above tests which extended over a two year period, do not include arresters which were evidently defective by visual inspection. The results do show that a large percentage of suspected arresters can be reclaimed.

Air Conditioning Group Appoints Public Relations Committee . .

An industry-wide Committee on Public Relations has been named by E. Holt Gurney, president of the American Society of Heating and Ventilating Engineers to clarify the public conception of air conditioning and define the service which users can expect from various types of systems.

Drawn from the major branches of the industry representing engineers, consumers, utilities, manufacturers and installers, the committee will develop an educational program designed to enlighten both the public and commercial users of air conditioning systems, hoping thus to combat misleading claims by unscrupulous elements which have thrived on the tremendous growth of air conditioning in recent years.

Attention will also be directed to bringing about a better understanding of correct temperatures and humidities to be maintained in air conditioned spaces in summer for health and comfort and to proper operation of air conditioning systems in stores, theatres and public buildings.

Line Construction Contracts Awarded

Stuart C. Irby Company, of Jackson, Mississippi, was awarded the contract to construct 259 additional miles of power lines by the Mitchell County Electric Membership Corporation recently. It is expected that five months will be required to complete the work for which $251,000 has been allotted.

APPLIANCE Service

Practical Pointers on Installation of Water Heaters

By Allen Parker

UNTIL recently, very little attention was given to the installation of an electric water heater other than to connect it to the existing hot water lines. Or if it was being installed in a new residence, the conventional type of hot water lines was installed. Almost every dealer has always depended on the old reliable plumber to see that it was properly installed.

The plumber, when asked, always knew the correct method of making such installations, which was the same method that had been handed down from the beginning. As a rule, this meant the use of as large galvanized pipes as was practical. This was for the customer's benefit to allow for corrosion and scale which soon forms on the inside of the pipe and partially restricts the flow.

Also, he wanted to be sure that the pipes didn't freeze during cold weather so he was very careful to see that they were buried at a proper depth under the ground. Considering the repair element, he put enough linear feet into the runs to make them accessible in the event they had to be dug up for repairs.

These principles all had a real moral behind them and a good plumber was almost ready to fight if you argued that the experience he had developed during a number of years was in vain and he was wrong. And in a good many small towns these principles were so well instilled in everyone's mind that the "city fathers" made sure that they would always be followed and passed a law that all water pipes must be buried to a certain depth under the ground.

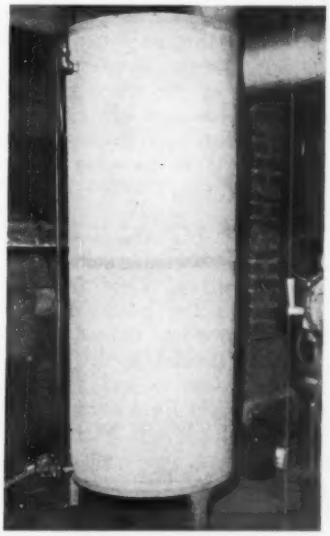
However, along with other measures adopted to cut the cost of operating electric water heaters, the old installation methods were scrutinized and found lacking in logic. Since then, new principles of good practice have been defined.

In considering the installation of an electric water heater, several guiding factors should first be determined. With the knowledge of these factors, the proper size and kind of pipe can be selected, the heater properly located, the pipe line efficiently laid out and all other problems correctly solved to give: (1) the best thermal efficiency, (2) low installation cost, and (3) over all satisfactory hot water service to the customer.

The water pressure should first be determined since water pressure is as necessary in choosing the size of pipe as picking wire sizes in an electrical circuit. This pressure can be obtained easily by making up a short piece of garden hose with a regular hose connection on one end and a water pressure gauge on the other. Then connecting this to an open faucet, with no water flowing, the pressure per square inch can be determined.

The next procedure: determine the maximum amount of water that might be required to flow in any one pipe, at any one time, for satisfactory service. Table A gives data accurate enough for most purposes. Total requirements may be determined by counting the hot water faucets and referring to the table. However, since it is doubtful that the entire number of hot water faucets would ever be open at one time, good thermal economy would dictate the use of a piping design with a capacity of approximately 30 per cent less than the maximum. The smallest size of pipe consistent with satisfactory water flow results in the lowest heat losses.

The heater should be located at a point as near as practicable to the



Copper tubing has many advantages when used for hot water distribution. Its ductility permits bending at the job, eliminating many ells and other fittings. Absence of corrosion and scale permits use of smaller sizes with consequent reduction in flow resistance and heat losses . . . .

Table A—Approximate Hot Water Requirements for Various Usage

Usage	Desirable Water Temperature	Total Mixed Flow Water	Approx. Flow of Mixed Water
Lavoratory	105 degrees F.	3 gal./min.	1½ gal./min.
Bath Tub	105 " F.	3 " "	1½ " "
Shower	110 " F.	6 " "	4 " "
Kitchen Sink	130 " F.	3 " "	3 " "
Dish Washer	140 " F. (min.)	5 " "	5 " "
Laundry Tub	130 " F.	5 " "	5 " "

Table B—Comparison of Heat Losses for Various Types of Piping for Hot Water Distribution

Type of Pipe	Kwh Loss Per Month*
Bare Iron Pipe, ½"	33.35 kwh
Iron Pipe, ½", With Standard Insulation	24.38 kwh
Iron Pipe, ½", With Best Insulation (Note 1)	18.22 kwh
Bare Copper Tubing, ½", Clean	18.60 kwh
Bare Copper Tubing, ½", Polished	18.21 kwh
Bare Copper Tubing, ½", With Standard Insulation	15.00 kwh

*Losses are based on 20 foot section of pipe; water temperature of 150 degrees F.; ambient temperature of 70 degrees F.; and NEMA drawdown cycle for average family use totaling 1,285 gal. per month.
(Note 1: This item is included for comparison but such insulation would not be practical because of size.)

hot water outlet that is used most frequently. This is to keep the heat losses low and, usually, will be found to be near the kitchen sink.

The lay out of pipe lines is next to be considered. Several typical lay outs can be followed, such as (1) to use one iron pipe for complete distribution; (2) use one copper pipe for complete distribution feeder; (3) use either copper or iron pipe and have an individual feeder from heater to each faucet; (4) or possibly a combination of any two of these lay outs may be used.

Plan No. 1 is used most frequently because of heater sales to houses already piped. Use of old pipes cuts down the initial installation cost. However, unless the lines are well insulated, the heat leakage is excessive and very seldom are these old lines arranged to result in the lowest thermal losses.

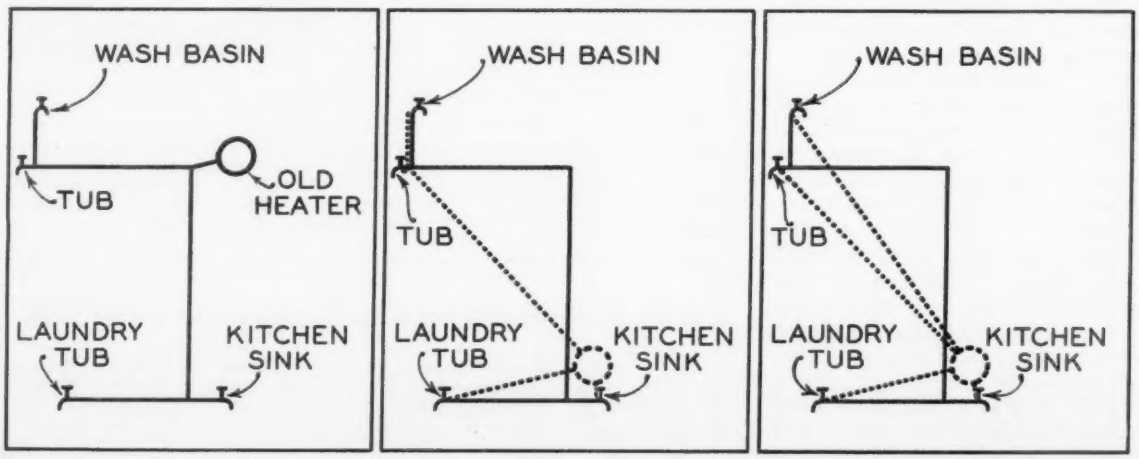
Plan No. 2, which utilizes copper tubing with the initial installation cost somewhat higher, offers the advantage of lower thermal losses. The advantage of this plan will be more readily understood by referring to Table B, prepared by a reliable technical concern. This table gives kwh losses per month on 20 ft. sections of various kinds of piping based on 150 degrees F. water and 70 degrees F. ambient temperature, assuming usage equivalent to the NEMA draw down cycle for the average family, estimated at 1285 gallons per month.

Where iron pipe is used, there is a definite saving and a worthwhile investment to use insulation where a reasonable life of several years can be expected. The value of this insulation rises sharply with an increase in size of pipe. However, we note from the table that bare copper tubing has losses lower even than insulated pipe. There is still a greater saving in polished copper but there does not seem to be a practical method of keeping it bright.

With the above characteristics of pipe in mind, it appears that copper pipe is the most suitable, and to effect further economies in both initial cost and heat losses we should reduce the size of the copper. This is possible because of reduced friction since tubing is polished on the inside and does not form scale or rust. Also, the tube may be installed without ells or sharp bends. In most cases, 3/8" O. D. tubing will be adequate for one or two faucets.

Plan No. 3, which connects each faucet individually, has some advantages in some particular installations and produces the maximum thermal efficiency. However, the excessive initial cost will usually offset these advantages. In general, plan No. 2 proves to be the most satisfactory over the period of the life of the heater since the additional cost of the installation is soon offset by the operating economies effected.

Successful calculations can be made directly, and possibly more easily, by making a rough sketch of the proposed layout and then redesigning to obtain the best features. The sketch should be drawn accurately, that is, the runs of pipe should be measured, so that the length of pipe on the sketch will be definitely known and a basis



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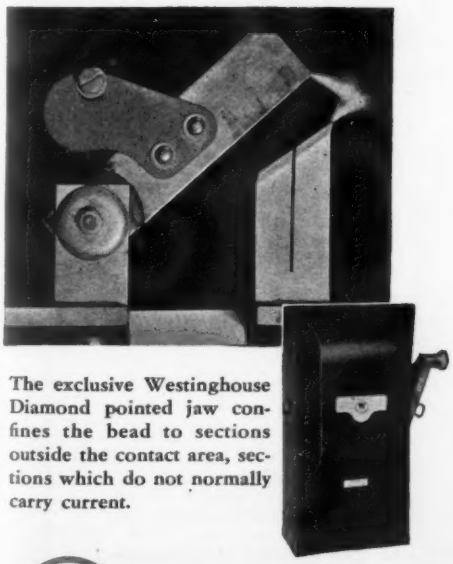

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provided for figuring the resistance of the lines.

The data in table C will simplify the figuring of the resistance in the lines when copper tubing is used. It has been calculated by adding to the working pressure: 4 pounds per square inch friction loss for the faucet, 2 pounds per square inch for overcoming the static head in a 5 ft. rise to the first floor. For second floor installations, approximately 7 pounds per square inch should be allowed. Approximately 25 per cent drop in service should be added to allow for sealing and friction loss up through the heater to the point where the hot water pipe leads off.

With a knowledge of the street and working pressure, the number and type of faucets, and the length of runs to be made, the table printed here offers an easy method of choosing the correct size of tubing for maximum operating economy as well as satisfactory water heating service.

This article has been intended to demonstrate the feasibility and

(*Continued on page* 50)

Air Conditioning Service Man's Responsibility . .

By H. J. Wilkinson

IN THE air conditioning field, the service man can have a far-reaching effect on sales. Many installations may be engineered properly, the salesman may have done a good job of selling, and the service man may have done a splendid job on the installation, however, unless the service man has gone a little further and explained to the customer how to take care of the installation, there is the possibility that disagreeable repair bills will be required later. When the owner of an air conditioning plant has such an experience, he will frequently influence others in their purchases.

An installation that came to my attention recently is a good example of such an incident. In this case there were no engineering, installation or equipment defects. However, in turning over the completed installation to the owner, the service man explained that the motor should be oiled regularly, that the belts should be kept adjusted, and that during the winter season the machine should be "pumped down." "Should be" were the words used instead of "must be" with an explanation why. The customer's automobile dealer tells him he "must" put anti-freeze in his car and he does it—so why shouldn't the service man go just as far and say the unit "must be" pumped down for the winter?

In this particular case, the hot air from the furnace blew through the air conditioning coil in the winter time. Assuming the temperature of this air to be even as low as 200 degrees, by referring to the pressure-temperature chart for Freon refrigerant, you can readily determine that a pressure of 400 pounds per square inch is not improbable. Actually, the oil as well as the refrigerant was forced out of the compressor at the seal. When overhauled for service the following summer, a charge of $30 was

(*Continued on page* 50)

Table C—Length of Copper Tubing Which Will Carry Given Flow of Hot Water at any Designated Working Pressure

Water Pressure Lbs. per Sq. In.		Maximum Pipe Length in Feet for Given Flow and Pressure								
		1½ gal. per min.			3 gal. per min.			5 gal. per min.		
Street	Working	3/8"	½"	5/8"	3/8"	½"	5/8"	3/8"	½"	5/8"
13	5	20	83	—	6	24	76	—	10	29
20	10	40	166	—	12	48	152	—	20	58
27	15	60	—	—	18	72	—	—	30	87
35	20	80	—	—	24	96	—	—	40	116
42	25	100	—	—	30	120	—	—	50	145
49	30	120	—	—	36	—	—	—	60	—
63	40	160	—	—	48	—	—	—	80	—
77	50	200	—	—	60	—	—	—	100	—
92	60	240	—	—	72	—	—	—	120	—
106	70	280	—	—	84	—	—	—	140	—
120	80	320	—	—	96	—	—	—	160	—
135	90	360	—	—	108	—	—	—	180	—
149	100	400	—	—	120	—	—	—	200	—

These calculations were made for first floor installations. For each additional floor, assuming 10 foot ceiling height, subtract 5 lbs. per square inch from the working pressure. These figures are based on Outside Diameter tubing because of its availability in most refrigeration and service shops.

The term working pressure refers to the pressure existing at the water heater. It is determined by deducting allowances for resistance to flow encountered between service and water heater. Assume that it is desired to determine the size of copper tubing to use for a fifty-foot run from heater to outlet. Maximum flow required is estimated at 3 gal. per min. A check of working pressure indicates that a pressure of 20 lbs. per sq. in. exists at the heater. The size pipe would be determined by reading across the line from the "20" listed under working pressure until the group of columns under the heading "3 gal. per min." is reached. This column indicates that a ⅜" pipe would deliver 3 gal. per min. only a distance of 24 feet at a pressure of 20 lbs. The ½" pipe would deliver this quantity of water at this pressure for a maximum distance of 96 feet. Accordingly, it would be necessary to use the ½" pipe for the given run of 50 feet.

MOTOR Service

Small Points of Importance In Armature Winding

3—More on Insulating Pads

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

IN THE winding of some motor armatures there are numerous items of insulating material that, though small physically, if omitted or wrongly applied, would result in failure of the winding in a short time. One such item is a small pad about two by three inches, shown in Fig. 1.

These pads are made from treated duck or treated asbestos and should be about 0.035 inch thick. They are used at the diamond points, front and rear of each coil, in armature windings using the drop-type coil.

In Fig. 1 the pad is shown in its proper position to protect all points where the S-shaped bend in the coils may make contact. The pad should not extend too far under the bottom part of the coil end, since it would then add too much insulation and cause coil ends to rise too high.

The function of these pads is to act as a buffer and separator between adjacent coil ends at the point where they bend up from the lower layer of coil ends to the upper layer. The general shape of the S-bend is shown in Fig. 2. This illustration also indicates how the pads are inserted to protect the upper part of the bend.

The bend should be covered for at least 1½ inch on each side of the center line of the drop point. Any pad that extends past the upper or lower section of the S-bend is excess material, which can be trimmed off from the upper section, but if the excess is on the lower section it will build up multiple layers under the coil ends and increase the height of the winding.

The excess or projecting material shown in Fig. 2 is trimmed off flush with coil ends as indicated in Fig. 3.

These pads are subjected to rubbing or chafing action and heat throughout the life of the winding; and the material, consequently, should be suitable for these conditions. Treated duck is satisfactory for windings using class A insulation. But the best pad for either class A or B insulated windings is treated (single dip) asbestos cloth. Tough and flexible, it will retain these qualities a long time under operating conditions. Thus, even the type of material selected is a small item, but it means the difference between short and long protective action. It pays, therefore, to watch the details.

When drop-type coils are shaped by the manufacturer, the bottom leads are all brought off in a single row from under the bottom front end of the coil. In winding armatures with such coils, these leads must be arranged in two layers, Fig. 3, and the formation of the leads from one layer to two layers is made directly under the coil. It is at this point—where the leads change from a one- to a two-layer formation—that a bit of insulation is important.

For coils having four leads, each

REALIZING that many winders fail to appreciate the importance of many minor factors in armature winding and insulation, Mr. Roe, author, engineer, and practical workman, has written a series of short articles, discussing only one phase of the subject at a time. The following article is the third of this series. Other articles of the series appeared in the July and August issues . . . . . .

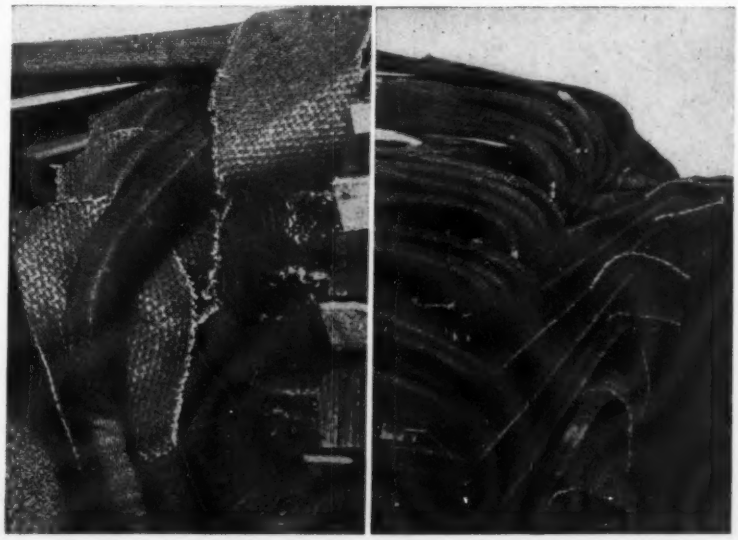


Fig. 1 (Left)—Treated asbestos pads in the proper position to insure adequate protection between diamond points and the adjacent coils at the points where the coil ends change from lower to upper layers. Fig. 2 (Right)—This view shows the pads in their proper places after all the armature coils have been finally installed and how they protect the complete area of the so-called S-bend between all adjacent coils.

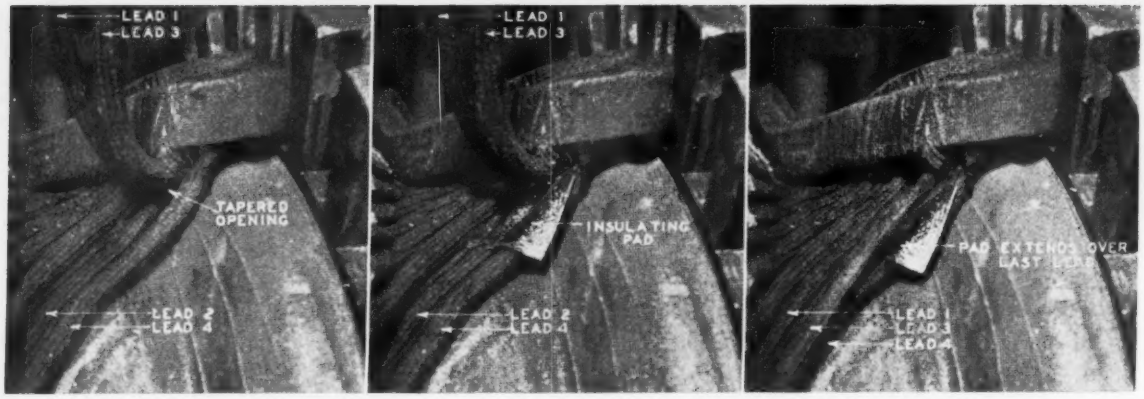


Fig. 3 (Left)—The four leads of the coil are separated into two layers by raising two leads. Fig. 4 (Center)—A pad of treated asbestos or duck is placed between layers, close to the coil. Fig. 5 (Right)—All the leads of the last coil are now laid down in two layers with the pad between. . . . . . .

layer would be two leads wide. However when coils have five leads, then the formation is two in the upper layer and three in the lower part of the first coil; the next coil has three leads in the upper layer and two in the lower. This order is then repeated as other coils are added: three down, two up; two down, three up, etc.

Now, when the leads are separated into the two layers and groups, there is a tapered opening left between the two leads in the bottom layer, as shown in Fig. 3. In order to prevent the leads in the upper layer from sinking into this open space when they are put down again, a small pad of treated duck or asbestos, about 1 by 1.5 inches in size is placed between layers, as shown in Fig. 4.

When the pad is placed between layers of leads, one edge should extend out over the last lead (that is, lead 4, Fig. 4) in the bottom layer; this overhanging piece protects the lead when the next coil is inserted. This arrangement is also visible in Fig. 5, in which the leads of the last coil installed are shown laid down in two layers. The reason for using this small piece of insulation becomes more apparent if we visualize how these leads are originally brought out from the coil and then rearranged. Consider that we are facing the front of a four-lead coil. We can call the first lead to the left lead 1; the next, lead 2; then 3 and 4. Now, when the coil is in the armature we lift up leads 1 and 3, and put leads 2 and 4 down in the first layer, as indicated in Fig. 3.

When we rearranged the leads, as mentioned above, we squeezed leads 2 and 4 together, but close up to the coil there is a space that tapers from zero to the width of one lead. If we try to close this space, the insulation on the leads where they leave the coil will be damaged. Then the safest procedure is to provide a gradual tapering opening, as in Fig 3, and then insert a small pad of tough insulating material between layers of leads on each coil. This pad will resist the pinching and shearing action of the lead in the upper layer when pressure is exerted on the winding, resulting in a tendency to force the lead down into the opening.

Thus two small details, one a small pad of insulating material, and the second the practice of forming a non-pinching opening between leads in the bottom layer can be made to pay dividends in longer life.

Pad Material Recommended

When the winding consists of coils using class A insulation, the pad should be treated duck, 0.035 inch thick. For class B insulated coils, a pad of treated asbestos, 0.035 inch thick, is recommended. The material shown in Figs. 4 and 5 is treated duck.

With coils having five leads, there are two of these tapered openings in each group of coil leads; and the same care must be exercised in arranging the tapered openings; that is, the leads must not be pinched together to close the space up to the point at which the leads emerge from the coil. With five-lead coils it will be found better to start the first coil with three leads in the bottom layer, as this arrangement permits of better control in grouping and laying the leads.

In all cases, insulation should be used between layers at the point of separation, and an easy tapering grouping of leads in each layer should be made.

New NEMA Motor and Generator Standards Published . . . . .

A new Standard has been released by the National Electrical Manufacturers Association. This publication, entitled, NEMA Motor and Generator Standards, Publication No. 38-49, supersedes the previous edition which was published in 1934.

This book contains all the information in the previous edition somewhat modified and augmented. Some of the new material is temperature ratings of various types of enclosed motors, standardized lettering for flange mounted motors, method of measuring motor vibration, etc. The section dealing with adjustable-speed direct-current motors has been revised to give the horsepower ratings for continuous, one hour and tapered duty. A new standard which should prove of interest is a table of maximum speeds by field weakening for constant speed d-c motors having standard horsepower and speed ratings.

Copies of this publication may be obtained from the National Electrical Manufacturers Association, 155 East 44th Street, New York, N. Y., for $2.00 a copy.

POWER COMPANY News

Trend Away From Municipal Ownership Noted . . . .

THE sale of its municipal electric system to the Virginia Public Service Company was approved by the City Council and citizens of Virgilina at a meeting held Monday, August 1, it was announced by M. J. O'Connell, president of the utility. Only one dissenting vote was cast against the sale of the municipal electric system, which had been in operation for the past 15 years.

The private utility rates will be made effective on connection and will result in reductions to residential customers as high as 35% and more, depending on the amount of current consumed, Mr. O'Connell said.

The passage of the resolution authorized the mayor to sign necessary contracts. Among the provisions was one giving the private utility a 30-year franchise.

Florida Town Rejects Municipal Power Plant Proposal

Palatka, Florida, voters rejected a municipal power plant and a $250,000 PWA loan and gift when they went to the polls July 26. An all time vote record was cast at the election and while the results were rather close, the majority opposed the municipal plant. Votes cast for were 768 and in opposition, 833.

The results of this poll are interesting from the fact that the election was held following a three-weeks campaign headed by the mayor and the city commission, proponents of the municipal plant.

Opponents to the municipal plant argued that the venture was uneconomical, that the service would be impaired and that equitable rates now existing would be increased rather than reduced 25 per cent as promised. The Florida Power & Light Company has a franchise to serve the city until 1944.

The city of Dothan, Ala., which had a varied experience operating a municipal light plant has closed it down and signed a five-year contract for current with the Alabama Power Company, effective August 1. The contract nullified an election set for Aug. 30 on floating $102,000 in bonds to finance the city's share in a $185,000 PWA project to recondition the municipal plant and double its capacity.

Among Dothan's experiences with municipal operation was to have a dam, erected at a cost of more than a half million dollars, to wash away. Operations never could be brought out of the red and in recent years it has been necessary to supplement the municipal plant output with purchases from the Alabama Power Company.

The contract with the power company provides that the city will continue to operate its distribution system, purchasing current for delivery at the switchboard. A sliding scale will determine electricity prices under the new contract. With a preliminary charge of one cent a kilowatt hour up to 375,000 kilowatt hours, excess current will be purchased at 4.50 mills per kilowatt hour. Last year it cost the city 9.7 mills per kilowatt hour to manufacture its own current.

Utility News Briefs

Electric rates for residential and other small lighting consumers in New Orleans were reduced, effective August 15, 1938, in accordance with an agreement reached between Mayor Robert S. Maestri and President A. B. Paterson of the New Orleans Public Service Inc.

The reduction cuts the top figure of the rate structure from 6½c to 4½c for residential customers and from 6½c to 5½c for other small lighting users. The reduction, which averages about 15%, will save New Orleans electric customers about $500,000 a year.

* * *

The Federal Power Commission announced recently its approval of the proposals of the Baton Rouge Electric Company and the Louisiana Steam Generating Corporation to dispose of their entire respective facilities, other than the bus properties and business of the Baton Rouge company, to the Gulf States Utilities Company in accordance with the terms and conditions set forth in applications filed with the Commission.

In authorizing the transaction, the Commission stated: "The merger of the three companies will tend to reduce the cost of future financing and result in a saving in administrative and overhead expenses, thereby aiding in a rate reduction resulting in an annual saving to consumers of approximately $100,000, which it was represented will be put into effect upon consummation of the proposed merger."

* * *

Alexander Speer, former president of Virginia Public Service Co., has been named chief engineer of the newly re-established Power Division of the Public Works Administration to handle power projects under the 1938 PWA program, according to an announcement by Administrator Ickes.

Mr. Speer's public utility experience covered many phases of electric operating companies' activities during a continuous period of more than 25 years. He served as executive vice president of the Florida Power Corp. and the Georgia Power & Light Co., and in 1937, after service with the Penn-Southern Co., became president of the Virginia Public Service Co.

* * *

Sale and transfer of the Tennessee Public Service Company's electric facilities to the City of Knoxville, the Tennessee Valley Authority and the Appalachian Electric Power Company at a total purchase price of $9,333,013 has been authorized and approved by the Federal Power Commission.

Embarking on a new type of lending, the Reconstruction Finance Corporation on June 27th announced it would lend $5,800,000 to the city of Knoxville, Tenn., to finance the purchase by the city of the local power distribution system of the Tennessee Public Service Company. The RFC is accepting bonds of the city which bear interest at 4 to 4½% and which mature serially over a period of 20 years.

This loan is the first of several which the RFC may make to enable

(*Continued on page* 50)

CODE Discussion

Southern Section I. A. E. I. to Meet in Jacksonville

DISCUSSION of National Electrical Code articles and proposed revisions will occupy the greater part of the business program of the annual meeting, Southern Section, IAEI, according to tentative program announced by A. J. Bommer.

The meeting will be held in Jacksonville, Florida, September 12, 13 and 14, with headquarters at the George Washington Hotel.

The meeting is in charge of a committee of which Walter A. Stall, chief electrical inspector of Jacksonville, is general chairman. C. S. Graham is chairman of the program committee and A. J. Bommer is arranging the business program.

Features of special interest will be: Southern Section president's address, J. L. Speights; International president's address, H. N. Pye; International secretary's report, V. H. Tousley; "Getting the Most Out of Electricity Safely," J. W. Whittington; "Synthetic Insulating Liquids for Transformers," L. F. Adams; "Motor Characteristics," J. M. Flanigen; and "Recent Electrical Work of Underwriters' Laboratories, Inc.," M. Brandon.

Among those who will lead discussions on the various code articles are: G. D. Affleck, G. M. Miller, H. N. Pye, O. K. Coleman, P. L. Muller, A. H. Schirmer, L. L. Newman, R. C. Miller, F. G. Camus, John LaTour, A. D. Campbell, W. A. Darden, Jr., James A. Mahan, N. E. Cannady, E. C. Coleman, B. F. Craig, C. S. Whitaker, J. G. Fisher, L. F. Adams, James Baldwin, Carl H. Bissell, F. G. Frost, R. L. Crawford, A. J. Bommer, J. L. Evans, R. H. Krell, I. A. Goggo, E. C. Knox, A. A. Coffin, C. N. Olivier, G. S. Moore, D. B. McCracken, George Welman, and F. C. Jurgens.

Virginia I.A.E.I. Meeting Well Attended . . . .

THE second meeting of the Virginia Chapter, I.A.E.I., was held in Richmond, June 23rd, with seventy-six members and guests present. T. W. Bowry presided.

Several sections of Article 100, 200 and 210 were read and Section 2110 occasioned a lengthy discussion. An explanation of their scope and ease of application was presented by V. H. Tousley and Jos. Whitner. A. L. Abbott and Mr. Tousley stated that from their observation, very little difficulty was experienced in the application of this rule in localities where it had been tried.

An interesting problem was presented and an expression of opinion requested of this Chapter, on the acceptability of installations of service equipment or fuse panels on baseboards in rooms of dwellings or other residential occupancies.

This method of installation was discussed fully and it was unanimously decided that it definitely did not conform to the intent nor expressed provisions of the Code, in that "the location of panel could not be considered as readily accessible, neither the service entrance cable nor panel was properly protected from mechanical injury that should be anticipated at this location, and that a distinct shock hazard was introduced to occupants of the building, with special reference to small children."

Section 2106 was discussed and on motion of J. S. Zebley it was decided that this section should be amended to permit longer taps, particularly on the larger branch circuits described in Article 210.

Several R.E.A. questions and problems were introduced at this time. The problem of grounding in rural districts was presented from several angles and discussed at some length by J. H. Stribling and Mr. Zebley. Mr. Zebley stated that proposed revisions covering common inter-connected grounding conductors for distribution and interior wiring systems were now being studied for incorporation in the National Electric Safety Code.

Section 4175 was discussed at some length and it was decided that the ordinary plug type of flush receptacles should not be installed in floors of any occupancies or buildings nor in show windows.

Another action taken at the meeting was the appointment of a committee of seven to study the desirability and advisability of spon-

(*Continued on page* 50)

Officers of Southern Section, IAEI. Left to right: Joseph Whitner, Atlanta, secretary-treasurer; J. L. Speights, Richmond, president, and A. J. Bommer, Dallas, first vice president. . . . . . .

UNIVERSAL ELECTRIC OVEN

Broils - Bakes - Roasts

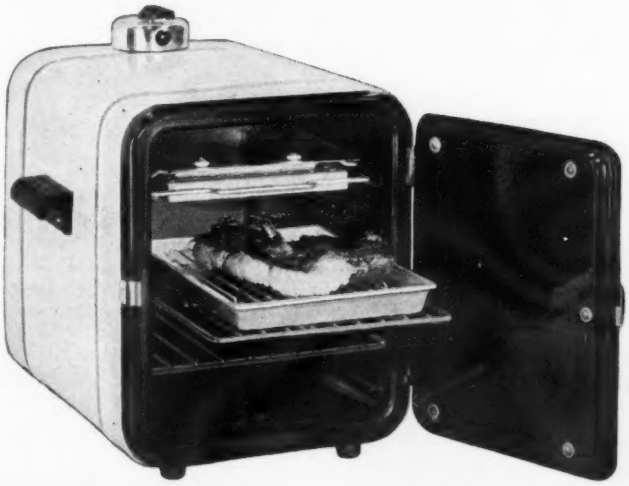
No Special Wiring Required

Cooks a complete oven dinner including a roast, 8 medium potatoes, peas and onions—sufficient for eight people.

No. E991

$29.95

With complete cooking equipment



Broils steaks, chops or fish with all the goodness seared in, the smokeless, spatterless way.

All the comforts, cleanliness and certainty of results of modern electric cooking.
Thousands of homes will want this New UNIVERSAL Electric Oven.
Its small cost and economical operation enable every housewife to have it.

MANUFACTURED BY **LANDERS, FRARY & CLARK** NEW BRITAIN, CONN.

WHOLESALERS' Activities

Williamson Elected Vice President Westinghouse Electric Supply Co.

Walter Williamson, manager of apparatus and supply sales, has been elected vice president of the Westinghouse Electric Supply Company. Mr. Williamson will carry the responsibility for the development of the Company's apparatus and supply business, both as to operations, through the Company's 72 branch houses in the field and relationships with suppliers.

Since 1910 Mr. Williamson has been actively engaged in the electric supply business. He was president of the Alpha Electric Company of New York City when that organization was acquired by the Westinghouse Electric & Manufacturing Company in 1926. Mr. Williamson continued as general manager of the Eastern District of the Westinghouse Electric Supply Company until June 1930, when he was transferred to headquarters as manager of supply sales, which position he held until his recent election to the vice presidency.

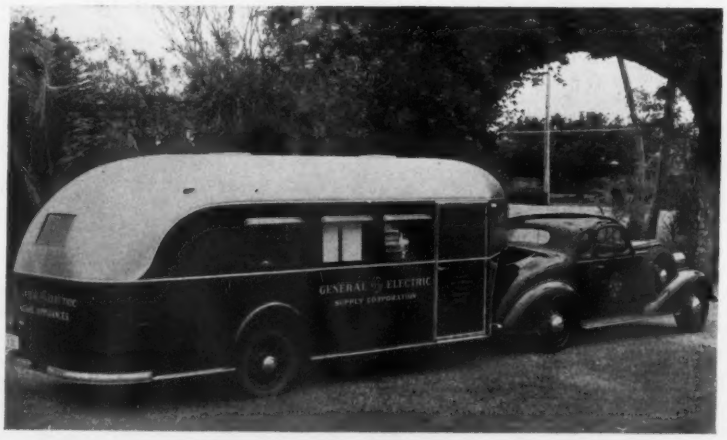
Undoubtedly one of the most widely known men in the industry, Mr. Williamson has been active in the Agent Jobbers Association, was its former president for several years, and is now active chairman of the Lighting Committee.

Walter Williamson

Southern Distributors Place In G-E Laundry Drive . . .

Orkil Electric Company, Hartford, Conn., appliance distributor, has emerged the winner in the nation-wide "Triple Play" 10-week sales drive carried on in the face of adverse business conditions by the General Electric Company.

Runners-up in the drive were Perry-Mann, of Columbia, S. C.; Furbay-Sommer, Canton, Ohio; and the G. E. Supply Corp. branches in Dallas and Salt Lake City.



A modern, stream-lined application of "Take the mountain to Mohammed" is being made in Florida by H. B. Zimmerman, ace salesman for the General Electric Supply Corporation, Jacksonville, who makes use of a demonstration trailer to take new appliances to the trade. Often, he cooperates with dealers by taking the trailer into rural or out-of-the-way places and staging demonstrations. In addition to display units, the trailer contains a panel of shelves for printed matter and folding tables for display purposes.

Charles W. Dustin Dies Unexpectedly In Atlanta

Charles W. Dustin, manager for the southeastern district of the Westinghouse Electric Supply Co., died of heart attack in his Atlanta office, August 18.

A native of Reading, Mass., Mr. Dustin was employed by the Westinghouse Electric & Mfg. Co. for many years before transferring to the Westinghouse Electric Supply Co. In 1932 he was appointed southeastern district manager with headquarters in Jacksonville, Fla. He moved to Atlanta five years ago when the district office was moved.

Henry Clower Joins Electrical Wholesalers, Incorporated . .

Henry W. Clower, well known in the Southeast as an electrical manufacturers' representative since 1930, has become associated with Electrical Wholesalers, Inc., of Atlanta, Ga., as vice president in charge of sales. according to announcement by Fred H. Dendy, president. Previous to the establishment of his manufacturers' agency, Mr. Clower was connected with the Carter Electric Co.

F. H. Dendy

H. W. Clower

Electrical Wholesalers, Inc., was organized in 1937 by Mr. Dendy, who resigned at that time as vice president of the Economy Electric Co., of Atlanta. Before joining the Economy Electric Co. in 1933, Mr. Dendy was associated with the Carter Electric Co. and its successor, the General Electric Supply Corp., for more than twelve years.

Frigidaire Branch Announced For Roanoke, Virginia . . .

Establishment in Roanoke of a branch office and sales room of Frigidaire Division of General Motors Sales Corporation, Dayton, Ohio, was announced recently by company officials. The branch office will function as the company's distributing outlet for the complete line of Frigidaire and Delco-Frigidaire products. The new office and show rooms will become operative at once, and will be located at 29 Franklin Road.

(*Continued on page* 50)

HALLMARKS OF MODERN RANGES...

...Chromalox Super-Speed units with EBONIZED MONEL DEFLECTORS

***Look for this sign of quality and you'll recognize ranges that* sell!**

Fast cooking at low cost is one thing the housewife wants. Another is *convenience and cleanliness.* Offer her a range equipped with Chromalox Super-Speed range units and Ebonized Monel deflectors, and she gets *both.*

Ebonized Monel deflectors must be able to take it. They must resist discoloration from the heat of cooking...and also the staining and corrosive effects of foods and liquids.

Does Ebonized Monel withstand such punishment? Does this shiny black metal *retain* its dark, attractive lustre? Ask any user. Modern housewives will tell you that the heat of cooking has no effect on the shiny black finish of Ebonized Monel. Also, that ordinary washing quickly removes spilled liquids and foods, and restores the dark shiny lustre, leaving no trace of a stain. The reason? Just this:

Ebonized Monel has already been completely "discolored" at a temperature greater than any approached in cooking. For this useful metal is regular rust proof Monel oxidized at 1900° F. Its tight coating of oxide sticks to the metal like ink to paper.

Over a dozen popular makes of electric ranges are now equipped with these new Chromalox units and Ebonized Monel deflectors *exclusively.* Investigate. Address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

MANUFACTURERS' News

Special Terms For Farmer Offered by GECC . . .

The plowshare is the pace-setter in three new appliance-financing plans that have been announced to G-E dealers by the General Electric Contracts Corporation. Recognizing that the farmer has come back strongly into the buying field and is an excellent prospect for appliance sales, as indicated by rural market surveys, the G-E financing organization is offering three plans through dealers to bona fide farmers who derive their income from farming.

The plans are pointed specially to those who lack sufficient regular income from dairy products and diversified crops to purchase on a regular monthly basis, and therefore must wait for harvest time to pay off. Equipment that may be purchased under the plans announced by GECC includes refrigerators, ranges, water heaters, dishwashers, kitchen waste units, commercial refrigeration equipment, home laundry equipment, and heating and air conditioning equipment.

The two-payment plan provides for a 25 per cent down payment, with the balance payable in equal amounts at the end of six and eight months.

A four-payment plan requires a 15 per cent down payment, with one-quarter of the balance due at the end of three, six, nine, and twelve months.

The third plan requires a 20 per cent down payment, with the balance payable in eight installments at the end of 3, 6, 9, 12, 15, 18, 21 and 24 months.

All features of the G-E customer insurance plan announced recently will apply to the farmer plans.

"Golden Harvest" Theme Features Silex Campaign

In a beautiful four-color booklet, The Silex Company, Hartford, Conn., announces its 1938 campaign, designated as the Silex Golden Harvest.

Announced as the biggest, strongest, most comprehensive drive they have ever made, the dealer campaign will center about the "harvest" theme.

Under the heading "Plowing the Field with the new Silex Line" the announcement presents the full line of Silex Glass Coffee Makers. This is followed by a section illustrating the advertising copy to be used in national magazines representing a total circulation of 34,924,073. Designated as "seeds to be planted in fallow fields," these advertisements emphasize the absence of excess acid in coffee brewed in a Silex.

The "harvest" phase of the campaign is a series of advertisements appearing in rotogravure sections of 53 newspapers having a combined circulation of 13,527,916 and 68 other newspapers having an additional circulation of 4,160,847. The booklet directs attention to the interesting fact that advertising coverage in some states will amount to over two copies for every family.

Other features of the campaign are a $5,040 window display prize contest open to all Silex dealers; a wide assortment of display material, direct mail pieces, mats, etc.; and a number of special "Golden Harvest" stock assortments.

New Kitchen Planning Book Released By Westinghouse .

A new and colorful presentation of the Elec-Tri-Center kitchens has just been made available by Westinghouse in its current Selling Booklet, "AS SIMPLE AS 1-2-3." This colorful book not only illustrates the planned electric kitchen, but it also introduces a new sales slant of appealing to the customer by selling her separate kitchen centers.

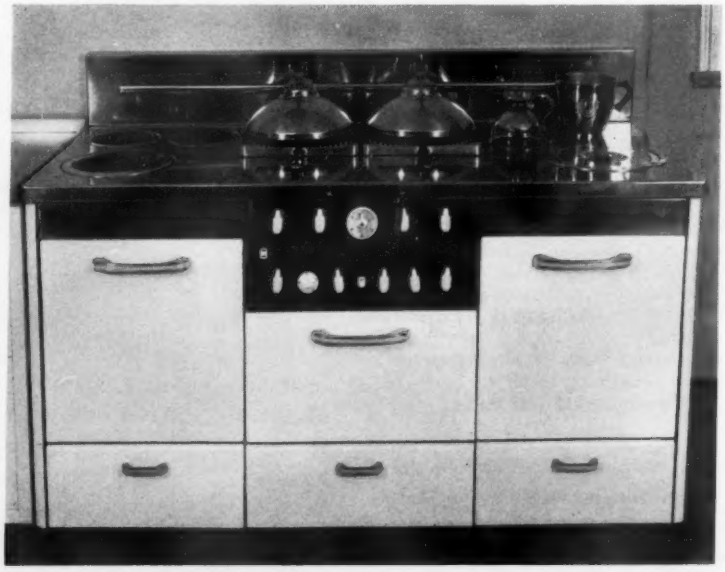
By dividing the kitchen into its accepted arrangement of the Refrigerator and Preparation Center; the Range and Serving Center; and the Sink and Dishwashing Center, the dealer is shown how he can make a complete electric kitchen presentation to prospects by the sale of individual centers.

By using the ideas advanced in this new book, dealers can advertise a definite kitchen merchandise, instead of promoting only the "idea" of a planned kitchen.

Frigidaire Survey Indicates Low Electric Cookery Cost

An interesting commentary on what the public thinks about the cost of operating an electric range is revealed in the results of a survey released recently by Frigidaire Division of General Motors. That the public, and particularly the range-owning part of the public, is rapidly coming to understand the real facts about range operating cost is clearly established in the Firgidaire check-up.

Several months prior to the announcement of their new range, Frigidaire's market research division sent a crew of fact-finders into the field to obtain from housewives who used electric ranges, their opinions as to just how much they thought



An interesting development in single unit kitchen equipment is the Cookery Bar recently designed and built by Frank E. Wolcott of The Silex Company, for use in his home. The Cookery Bar is more than a range. In fact, it is a complete kitchen. There are two table height surface broilers for convenient and visible broiling—a coffee maker of the exact size necessary for the most efficient operation, equipped with an Anyheet Control which keeps coffee at drinking temperature indefinitely—a built-in Culinaire Mixer with the shaft exposed for easy changing of the mixing units —a two-slice Toastmaster toaster, lowered so the slots are flush with the top—a concealed automatic water heater designed for instantaneous delivery of water at a temperature of 195°—all in addition to the three electric cooking elements and the thrift cooker found in the usual electric range. . . . . .

MODEL 240
BEVERAGE COOLER

CASH REGISTER *Music* BY

PELCO

Electric

BEVERAGE & BEVERAGE-FOOD COOLERS

Here's a clean, sweet manufacturing job that's making money for its users—the basis of more and profitable sales for YOU. Write for facts.

Good news travels fast, too! The places selling bottled beverages and foods are enjoying the tinkle of cash register music stimulated by PELCO—because it brings repeat business and cuts cooling costs. Naturally, that's good business for PELCO dealers—and all over the nation, wide-awake dealers are profiting from the easy sales PELCO builds for itself. All PELCO models are "package-type"—plug into any light socket. Without obligation, find out what the PELCO franchise can mean to you.

Mfg. by Refrigeration Division
PORTABLE ELEVATOR MFG. CO.
BLOOMINGTON ILLINOIS, U. S. A.
IN CANADA, UNIVERSAL COOLER CO. OF CANADA, LTD., BRANTFORD, ONTARIO

Address Desk 0-98

they were paying each month in operating cost for cooking and baking.

Regardless of just what the operating cost might be in fact, Frigidaire felt that the user's attitude of mind on the subject must be considered a very important factor in future range marketing, and for that reason it went directly to the people primarily concerned, namely, the housewives themselves. The question used was the same in all territories, and in itself was extremely simple.

It was: "What do you think your cooking cost was for last month?"

Most of the women said they knew or had a fairly accurate idea. The grand average for all territories proved to be a figure of $2.30 per month, while 80 per cent of all people interviewed said their bill was under $3.00 for the month.

Stromberg Office Moved

Stromberg Electric Company of Chicago, Ill., manufacturers of time recording systems have moved their southeastern divisional headquarters from Charlotte, N. C. to 406 Walton Building, Atlanta, Ga. J. Read Abrams, district manager for this company will join S. S. Dewson in the Atlanta office.

News About People

To consolidate general responsibility for the sales of wiring devices, conduit products and wire and cable, J. H. Crawford, manager construction material sales at the Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn., has appointed A. E. Newman as manager of wiring material sales. Originally, the responsibility for each of these three products was carried by different sales sections.

A. E. Newman

Sales managers for two of these products were appointed by Mr. Newman as follows: F. A. Parnell, sales manager of conduit, and J. F. Farnam, sales manager of wire and cable.

Other appointments made by Mr. Newman in line with the policy of consolidation of wiring materials sales operation include that of L. F. Giblin as supervisor, distribution development, wiring materials and of J. P. McIlhenny as sales manager of the wiring materials field organization.

* * *

R. J. McCabe has been appointed manager of sales, electrical materials, for the Indiana Steel & Wire Company, Muncie, Indiana. Announcement of the appointment is made by Fred M. Crapo, vice president and general manager.

R. J. McCabe

Mr. McCabe becomes associated with the Indiana Steel & Wire Company after nearly 30 years' service with the Western Electric Company and Graybar Electric Company. He joined Western Electric at Dallas, Texas, in 1909 and served successively in St. Louis, Kansas City and Florida.

In his new connection, Mr. McCabe will direct the sale of Crapo galvanized steel power conductors, telephone wire, steel strand and other products, to the utility field.

* * *

Bruce A. Fleming has been appointed executive secretary of the refrigeration division of the National Electrical Manufacturers Association taking the place of Haldeman Finnie, who resigned to become treasurer of a Detroit advertising agency.

During the last few years, Mr. Fleming has been executive secretary of the electric range, electric water heater and domestic sections of NEMA.

The Refrigeration Division's activities will be transferred from Detroit to NEMA's New York Headquarters.

* * *

The rapid growth of the air conditioning business plus the future possibilities for this comparatively new industry have caused Westinghouse to reorganize its air conditioning department with headquarters located at the company's East Springfield, Massachusetts, Plant, effective September first.

P. Y. Danley has been named as the manager of the Air Conditioning Department, the Westinghouse announcement said. S. F. Myers has been appointed assistant manager, located in Chicago, Illinois. It was felt that more efficient customer service would be given through the establishment of an office in the midwest territory near one of the largest potential markets for air conditioning equipment.

Danley, who will be responsible for all commercial and household air conditioning activities, has appointed H. F. Hildreth to direct the sale of home air conditioning equipment.

* * *

I. H. Sclater has been appointed managing engineer of the power transformer department of General Electric's Pittsfield works, according to a recent announcement by the company. In his new capacity Mr. Sclater is in charge of both the engineering and manufacture of G-E power transformer equipment.

Mr. Sclater has been continuously associated with General Electric since 1906 when he entered the company as a "test" man. He was placed in charge of the design of oil insulated transformers in 1923, and in 1931 became assistant engineer of the transformer engineering department. Mr. Sclater was made engineer of the power transformer engineering department in 1933.

* * *

W. H. Berry, Jr., formerly associated with Henry W. Clower, sales representative, has taken over the business. Mr. Berry has been selling electrical supplies and equipment for some 13 years and is well known throughout the entire Southeast.

W. H. Berry, Jr.

He will represent the following manufacturers: Chase - Shawmut Company, Grahling Brothers Company, American Electric Switch Corp., Schwarze Electric Company, Tork Clock Company, Lowell Insulated Wire Company, and Haring Switch Plate Company.

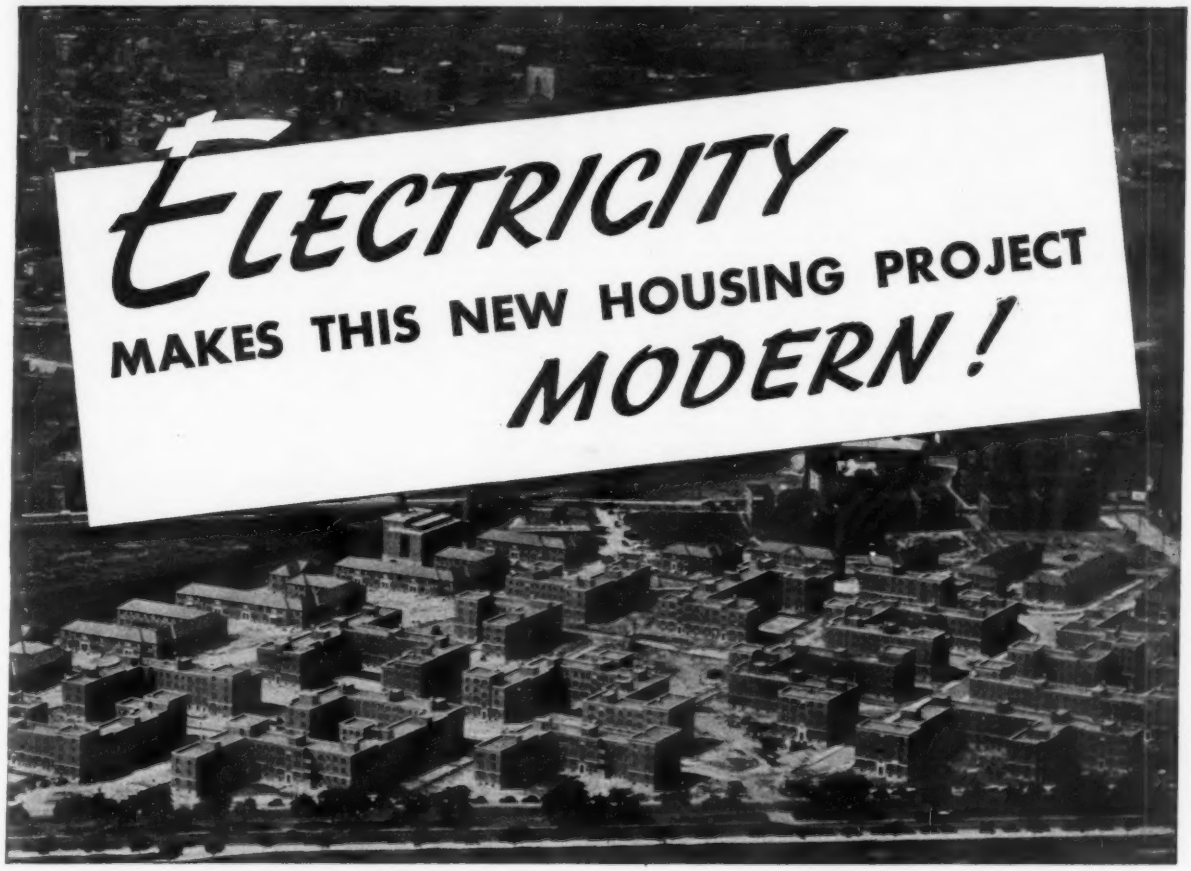
Mr. Berry will maintain an office and complete warehouse and shipping facilities at 88 Pryor Street, S. W., Atlanta, Ga.

* * *

R. E. Uptegraff Manufacturing Company, Pittsburgh, Pa., has appointed Walter G. Gearhart Company, Volunteer Building, Atlanta, Ga., representatives for the sale of Uptegraff Transformers.

* * *

W. L. Corbet was recently appointed Bull Dog Electric Products representative for Baltimore, Md. Mr. Corbet formerly represented the same company at Scranton, Pa.



And AMPEROX Performite Building Wires

will keep it Modern for Years to Come

VISITORS from all over the world have been attracted to the new Government low-rent housing project at Old Harbor Village, Boston, Mass. This undertaking, built at a cost of over six million dollars, provides living units for 1016 families.

An important feature of this development is that it includes every modern electrical improvement, including lighting fixtures, laundry, electric stoves, refrigeration and air conditioning. The project was wired with American Steel & Wire Company Amperox Performite Building Wires and Cables.

Amperox Performite Building Wires and Cables are chosen by those who prefer rubber insulation of the "super-aging" type. They conform in all respects to the requirements of Federal Specification J-C-106 covering single and multiple conductor cables, both braided and lead sheathed types, for working potentials up to 5000 volts.

Also important in Amperox Performite construction is its Firefite flame-retarding braid which "pulls" easily, does not react to temperature changes, resists moisture and will not carry flame nor support combustion. We will be glad to send you complete information concerning this product.

ADEQUATE WIRING SERVES AND SAVES

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Universal Clean Air Cleaner Announced .

A new model Universal Clean Air Cleaner, No. E60, is announced by the manufacturer, Landers, Frary & Clark, New Britain, Conn.

Designed to sell at a retail price of $59.95, this new Universal Clean Air Cleaner embodies a radical change in construction that improves its air-travel principle and gives added years of trouble-free service. Its double turbine-type blades cause a very powerful Whirlwind Super Suction that draws surface litter, dust and embedded dirt direct from the nozzle to an enclosed bag without first passing through a revolving fan as in the conventional type cleaner. No dust can be retarded to eventually cause wear or lack of full efficiency.

Universal's motor is located at one end of cylinder—the bag at the other end and between them is Universal's Germ Trap. Air enters the nozzle, deposits dust and dirt in the bag—and continues through to the Germ Trap where it is thoroughly cleaned before it passes back into the room.

Universal's complete set of attachments are ingeniously designed to augment the easy, speedy and thorough cleaning of, and to give extra uses to, the more powerful Whirlwind Super Vacuum. Great care and precision go into the manufacture of the Universal's attachments to make sure that couplings and connections are air-tight and that their use will result in the maximum cleaning efficiency.

NESCO Announces New Table Broiler and Griddle . . . .

A new electric table Broiler-Griddle which will fry bacon, eggs, and chicken, broil steaks and chops, griddle wheat cakes and meat patties, make toast and toasted sandwiches, and bake or warm biscuits, buns, rolls, and muffins, has just been announced by NESCO. Made to retail at $9.95, this new Broiler-Griddle has several outstanding features and selling points which are exclusive with NESCO.

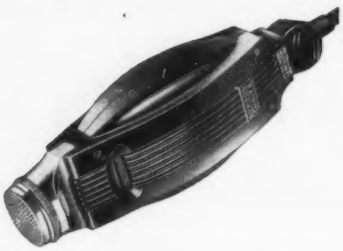
One of these is a reversible heating element, so made that it can be placed below the cast aluminum griddle for fast or slow frying, or in the cover in a true broiling position to impart a delicious barbecued flavor to the meat.

Another of the outstanding features of the NESCO Table Broiler-Griddle is the cast aluminum platter of Georgian design. This platter has a flat, true griddle surface which makes it ideal for frying and griddle-cooking. With the detachable walnut handles it can be served right at the table while the meat is still sizzling hot.

Ronson Electric Shaver

Ronson Products, Inc., of Newark, N. J., have just begun shipments of their latest product, Ronson Shaver, an electric dry shaver radically new and different, both in principle and performance.

The most outstanding departure in the Ronson Shaver is the fact that it uses a hollow-ground blade, similar in construction to straight razors. This blade is said to give a close shave without heat or irritation, and with the greatest of speed and cleanliness.



Ronson motor requires no oiling and consists of the fewest possible number of parts, Ronson Shaver includes a built-in radio interference eliminator.

New Hamilton Beach Vibro-Massager . .

In the new Vibro-Massager, Hamilton Beach, for the first time, has combined the two essentials for effective mechanical massage—kneading action and vibration. The Vibro-Massager gently grips the flesh and raises it between the velvety sponge-like sphericals in much the same manner as does the trained masseur. As the sphericals roll over the flesh, they impart a kneading and squeezing friction similar to that produced by a masseur's nimble fingers. To this kneading action the Hamilton Beach Vibro-Massager adds gentle but positive vibration—a combination that results in a most effective and stimulating massage.

The Vibro-Massager has a compact Hamilton Beach motor, toggle type vibrating movement (adjustable for wear), handy switch and lustrous baked enamel finish in black. Listed by Underwriters' Laboratories, Inc. Operates on 110-120 volts, D. C. or A. C. up to 75 cycles. Packed with instruction sheet in fitted carrying case. Priced at only $9.85, slightly higher West.

Cutler-Hammer "Tri-Branch Fuser"

A new addition to their service control line, the "Tri-Branch Fuser," is announced by Cutler-Hammer, Inc., Milwaukee, Wisconsin.

This device is a three plug fuse panel designed to serve three lighting or household appliance circuits.

The manufacturer claims that it provides an economical means of increasing the number of branch circuits essential to adequate wiring without sacrificing convenience or safety, and that it was developed primarily for the low cost home market.

A hinged door in the "airstyled" flush plate gives access to the fuse sockets which are adaptable to any type of approved plug fuse. Fuses are easy to change, and a dead-front plate of Bakelite provides protection from all live parts.

According to Cutler-Hammer engineers, maximum ease and speed of installation is possible because the flush plate is removable by loosening four screws.

Office Lighting Booklet

Recognizing that adequate lighting is being recognized more and more as an important factor in improving office efficiency and that the average office worker has a difficult seeing task to perform, the F. W. Wakefield Brass Company, manufacturers of lighting specialties, has just announced a new publication entitled "Recommendations for Office Lighting." A copy of the booklet may be obtained by writing the F. W. Wakefield Brass Company, Vermillion, Ohio.

WADSWORTH

Announces

NEW 100 AMPERE SERVICE EQUIPMENT

WADSWORTH'S 3800 Line is NOW available from 30 to 100 Amperes. These devices meet the most rigid inspection requirements and Contractors recommend them for safe operation under all conditions.

NOW available in three 100 Ampere Styles:

Cat. No. 3813—3 Pole, 125/250 Volt, A.C. Solid Neutral No Branch Circuits.

Cat. No. 3813BRW4—3 Pole, 125/250 Volt, A.C. Solid Neutral 4 Lighting Circuits, 2 "Renu-Fuse" Pull Cover Units.

Cat. No. 3813BRW8—3 Pole, 125/250 Volt, A.C. Solid Neutral 8 Lighting Circuits, 2 "Renu-Fuse" Pull Cover Units.

FINISHED IN ALUMINUM

"Renu-Fuse" Pull Cover Units equipped for two 60 Ampere cartridge fuses. When specified can be equipped with one 60 and one 30 Ampere unit for cartridge fuses. "Renu-Fuse" units can be used for Range and Water Heater connections.

See Your Electrical Wholesaler

BUY WISELY . . . BUY WADSWORTH!

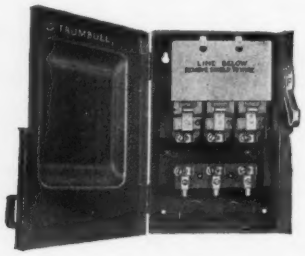
The WADSWORTH ELECTRIC MFG CO. INC.

Covington, Kentucky.

New Heavy Duty Trumbull Industrial Switch . . .

A new Type "RBA" heavy duty industrial switch is announced by the Trumbull Electric Mfg. Co., Plainville, Conn., in Circular No. 300 just issued.

These Type "RBA" heavy duty industrial switches are designed for use as motor circuit disconnects, motor controllers, main entrance switches, individual units on industrial switchboards, disconnects for transformers, capacitors, industrial magnets, on heating installations such as furnaces and ovens and as sectional disconnects in buildings or factories.

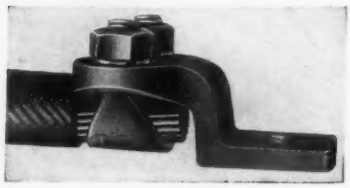


Being rated in horsepower and of heavy construction they can be used as manual motor controllers for wound rotor or D.C. motors; or where a motor starts under a light load and fuse protection is deemed satisfactory and can be applied—according to Article 430 of the 1937 Nat. Electrical Code.

The new switch, which supersedes the old "RB" line, retains all advantages of the old line and offers many new features. Some of these are as follows: interior mounted on a removable saddle with all terminals accessible from the front; a new space-saving handle with provision for close ganging; heavy cover catch and releasable interlock; wiring gutters; and solderless connectors.

Flexibility Featured In Burndy's New Varilug

The Varilug is recommended by the manufacturer—Burndy Engineering Co., Inc., New York, N. Y., for connecting a wide range of cable sizes without keeping an extensive stock of lugs on hand. The Varilug's flattened U-bolt not only makes it possible to use this connector on many sizes of cable, but also prevents damage to highly compressible flexible and extra flexible cables.



Vari-connectors, in addition to lug illustrated (type VA) are also furnished in the form of angle lugs, T-connectors, end-on-end joints, elbows, stud clamps, reducers, etc.—all employing the flattened U-bolt principle.

New Universal Dual Purpose Anchor . .

The A. B. Chance Co., Utilities Division, of Centralia, Mo., announces a new Universal Dual Never-Creep Anchor developed to meet the demands for an inexpensive anchor to use in machine bored holes or as a "deadman" to use in place of bulky logs, concrete blocks, or improvised scrap iron slugs.

Being made of cast iron, it can be furnished much cheaper than other types of anchors and yet it is so constructed that there is very little danger of breakage in handling, shipping, etc.

It is sturdily constructed and well proportioned and can be depended upon to do a real holding job, having a maximum load recommendation of from 22,000 pounds for the smallest size to 42,000 pounds for the largest. Dual Never-Creep anchors can be easily stacked and take up much less space than concrete blocks, logs or slugs and being less bulky, they are easier to handle.

Cable Fault Location Booklet Offered . .

"Notes On Fault Location In Cables" is the title of a handbook just published by Leeds and Northrup Company.

This 52-page pocket-size book will be useful to anyone interested in fault location—whether in communication transmission, or in electric-power transmission. It gives facts helpful to the tester when locating any of a variety of faults. Illustrated with diagrams, it explains methods for identifying faulty wires in a cable, for measuring conductor resistance, for locating grounds and crosses by Murray and Varley Loop tests, for locating opens.

A copy will be sent promptly, no charge, to anyone who asks Leeds & Northrup Company, 4934 Stenton Avenue, Philadelphia, Pennsylvania, for Notebook E-53-441.

STEEL STRAND ◆ TELEPHONE WIRE
Crapo
GALVANIZED PRODUCTS
SCIENTIFICALLY MADE TO MEET SPECIFIC DEMANDS
Crapo Galvanized Steel Strand is produced from start to finish to meet the specific demands of the service for which it is intended. Each wire used in forming a particular size and grade of strand is made from the same special steel, scientifically processed in the same way, uniformly galvanized by the Crapo Process. The tough, heavy, pure zinc galvanized coating, tenaciously bonded to the wire by the Crapo method, withstands the abuse of construction, provides lasting protection.
Crapo Galvanized Strand and Crapo Galvanized Telephone Wire constantly are setting new records for long, economical life and low maintenance costs. Ask your Jobber, or write direct!
INDIANA STEEL & WIRE CO.
Muncie, - - Indiana

THEY ALL AGREE ON UPTEGRAFF *transformers*

"Quality and Service," then built in ability to stand up and take it, have made Uptegraff the first choice on scores of installations of every type of Transformer.

The Uptegraff line includes Transformers for every purpose—Power, Distribution, Current and Potential, Subway, Rural and Dry Type Transformers, and Reactance Coils. Each Uptegraff Transformer is designed and built up to the highest standards of NEMA and AIEE.

Tell us your Transformer requirements and let us quote. Write for special Bulletin on the type of Transformer you require.

UP TO 3000 KVA — 66,000 VOLTS

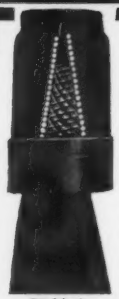
R. E. UPTEGRAFF MFG. COMPANY
308 NORTH LEXINGTON AVE., PITTSBURGH, PA.

"Thread-On" Users

GET THE WIRING JOBS

Keep up with the fast-moving Electrical Industry. Modernize and profit by using "Thread-on" Connectors. They are reliable—safer—more economical—convenient to use! No blow torch, solder or tape required.

Patent No. 1,700,985



Molded "Thread-on" Connectors

APPLIED QUICKLY, EASILY

—without tools. Just skin the wires and twist on a "Thread-on"—that's all!

BETTER ELECTRICALLY—STRONGER MECHANICALLY

—Wires are compressed tightly together giving perfect copper to copper contact — clean threads are *pressed* (not cut) into the wires, stranded or solid, assuring a doubly secure *permanent* and *trouble-free* joint. Perfectly insulated — no more grounds and shorts through tape failures. Unaffected by heat, moisture or acids.

FULLY APPROVED

—Listed by Underwriters' Laboratories, Inc. and other electrical authorities. Approved by Electrical Inspectors, Architects, Owners, etc.

Conex "Thread-on" Connectors

MILLIONS IN USE

BRYANT ELECTRIC CO., Bridgeport, Conn. (Manufacturing "Bryant" Connectors exclusively.)

Porcelain "Thread-on" Connectors

GENERAL ELECTRIC CO., Bridgeport, Conn. (Manufacturing "G. E." Connectors exclusively).

IDEAL COMMUTATOR DRESSER CO., Sycamore, Illinois. (Manufacturing "Ideal" and "Excel" Connectors exclusively.)

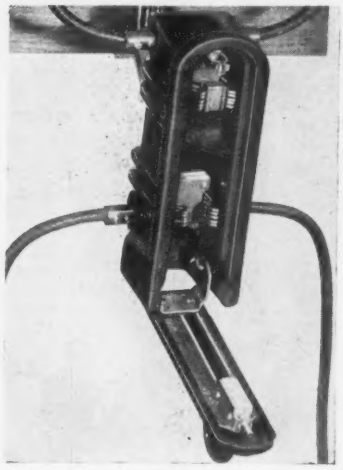
WEISS & BIHELLER MDSE. CORP., 584 Broadway, New York, N. Y. (Manufacturing "Simplex" and "Conex" Connectors exclusively.)

WIREMOLD CO., Hartford, Conn. (Manufacturing "Wiremold" Connectors exclusively.)

FREE SAMPLES Write any of the five manufacturers listed.

Kearney By-Pass Disconnect

James R. Kearney Corp., St. Louis, Mo., announces a disconnecting switch for manually removing load from apparatus on which it is necessary to make adjustments. The unit is designated as the Kearney By-Pass Disconnect and is rated 100 amperes at 7500 volts.



Opening the switch permits a by-pass contact to close the circuit directly between the two upper multi-point pressure contacts, before the double blade leaves the contacts, and simultaneously disconnects the balance of the switch and the apparatus. The simple trouble-free mechanism will give years of service.

These By-Pass Disconnects are designed for use with step voltage regulators, booster transformers, and current transformers of primary metering equipment.

Benjamin Explosion-Proof Angle Bracket Fixture . .

To provide an explosion proof lighting fixture for locations in which it is not possible to mount the lighting units overhead the Benjamin Electric Mfg. Co., Des Plaines, Ill., is announcing a series of Angle Bracket Type explosion proof fixtures suitable for side wall mounting.

These units are listed by the Underwriters' Laboratories as explosion proof fixtures suitable for hazardous locations in which flammable volatile liquids or other substances are manufactured or stored. This includes Class I, Groups C and D locations with atmospheres containing ethyl ether, gasoline, petroleum, naphtha, alcohol and lacquer solvent vapors.

Walkerized Dualcote Conduit Offers New Protection . . .

Recognizing the need of seaboard communities for a conduit that will withstand salt water corrosion, and the need of railroads, oil refineries, pulp and paper mills, and such industries, for a conduit with strong acid-resistant properties, Walker Brothers of Conshohocken, Pa., announce their new Dualcote conduit protected against salt water, acids and caustics by a unique second coating.

The outer finish utilized on Dualcote conduit, according to the manufacturer, contains a new, inert ingredient which is practically indifferent to chemical reaction. This substance is carried in a vehicle which dries by evaporation rather than by oxidation, and consequently relies on no oils that can be broken down by corrosive agents.

Some idea of the acid-resistant quality of this new coating may be obtained from tests announced by the manufacturer, After being immersed for one hundred hours in a 7 1/2 per cent solution of sulphuric acid Dualcote conduit was found to be completely unaffected. Similarly, immersion for five days in a 7 1/2 per cent solution of caustic soda had no effect on Dualcote's protective coating. Samples of Walkerized Dualcote successfully withstood without injury a salt spray test in which the samples were bathed constantly in a dense mist, containing 2 per cent sodium chloride.

According to the manufacturer, this new conduit derives its qualities from the unique process of combining two protective coatings, each of which plays an important part. The Walkerizing process consists of a uniformly distributed coating of zinc on the inner as well as the outer walls of the conduit. The interlocking of the steel with the zinc, and the zinc in turn with the outer protective coating, gives this new product a durable finish which, besides being tough and flexible, will not crack or chip when the conduit is bent during installation or under the roughest kind of handling.

New Bulletins Available

Shut-O-Vent Ventilation is the title of a 12-page booklet just issued by **Reed Unit-Fans, Inc.**, New Orleans, La., which includes complete data on the fan units manufactured by that company.

Included in the publication are specifications and descriptions of Reed Unit attic fans; the Shut-O-Vent, an automatic shutter designed for use in attic fan suction boxes; kitchen ventilation fans; Wind-O-Vent; and commercial ventilators suitable for commercial and industrial applications.

* * *

Farm profits and savings resulting from the use of electric motors on the farm are listed and analyzed in a new 12-page publication issued by **General Electric Co.**, Schenectady, N. Y.

Every important use for motors on the farm is analyzed in a "summarized data guide chart" which briefly and simply sets forth the type, rating, and power consumption of the motors recommended for performing each of about 70 farm jobs.

* * *

Much new data on varnished-cambric-insulated cable are contained in a 32-page bulletin (GEA-2623) issued by the **General Electric Co.**, Schenectady, N. Y.

. . . chortled the Sales Mgr. to the Adv. Mgr.

"Don't faint, Al. I know it sounds strange for my men to say they want more advertising. But they do. Not a bigger total budget, but a bigger chunk of our advertising dollar used to help 'em get our story to the electrical industry of the South . . . more ads in ELECTRICAL SOUTH.

"You and I have had plenty of battles. But today, when the management is after me to get more sales at less cost, I'm going to need all the help that advertising can give my men.

"You've told me how ELECTRICAL SOUTH covers the market we have to sell . . . how it does a swell editorial job—and how we know it is read because its readers pay subscription cash for it. Those readers are my gang's propects and since it costs less than the price of a cheap cigar per prospect to reach them, let's "hype up" our schedule in ELECTRICAL SOUTH. Let's cultivate the men that my men have to sell."

"All I can say," muttered Ad. Manager Al, "is that the old order changeth when a hard-boiled sales manager like you learns to appreciate the media worth of a strong business paper like ELECTRICAL SOUTH."

Highest editorial standards and publishing integrity.

ELECTRICAL SOUTH

(bears the twin hall-marks of known value)

Proved reader interest in terms of paid circulation.

Virginia I. A. E. I. Meeting Well Attended . . .

(*Continued from page* 36)

soring or advocating state electrical legislation covering installation rules, licensing and inspection services. Chairman Bowry appointed the following members on this committee. J. L. Speights, F. P. Sagendorf, W. J. Walsh, J. M. Murphy, J. S. Goldback, C. H. Dougherty and L. S. Armentrout.

Atlanta Engineer Named President of IAEI . .

H. N. Pye, chief engineer, South-Eastern Underwriters' Association, Atlanta, Ga., was elected president of the International Association of Electrical Inspectors, at the annual meeting of the Executive Council of the Association, held recently.

Mr. Pye has participated in the activities of the Association from the date of its organization. He has served the organization in many capacities and has played an important part in code revision.

Other officers elected include: F. N. M. Squires, first vice president; K. W. Adkins, second vice president; C. E. Hardy, third vice president; H. A. Patton, fourth vice president; and V H. Tousley, secretary-treasurer.

Utility News Briefs

(*Continued from page* 35)

cities to purchase private utility systems within the areas of large federal or state power development projects, RFC Chairman Jesse H. Jones explained.

Practical Pointers On Water Heater Installations . . .

(*Continued from page* 32)

economy of careful planning for electric water heater installations, and to direct attention to the unusual advantages offered in copper tubing for this purpose. The average installation man will find soft drawn O. D. tubing to be most easily adapted to this work and that it can be used with the regular flare and cutting tools, nuts and fittings now used in refrigeration work. Since it is soft, it is easy to bend thus elminating ells and some other fittings, and producing a reduction in labor expense.

It should be remembered that these lines, regardless of the type of pipe used, should always be arranged so that they may be drained during freezing weather when not in use. However, copper tubing is ductile enough to withstand freezing six times before bursting.

Air Conditioning Service Man's Responsibility . .

(*Continued from page* 32)

made for a 20-pound refrigerant charge.

The $30 charge was not unreasonable but it could certainly have been avoided by telling the owner definitely why his refrigeration system should be pumped down for the winter season. This can be explained in simple non-technical language which will impress the customer with the service man's interest and thoughtfulness.

The prevention of trouble such as that described will leave the owner of an installation with an entirely different opinion of the relative value and cost of air conditioning in the home. Incidentally, since a satisfied customer is the best possible source of further sales, such a policy will prove to be a profitable one.

Frigidaire Branch Announced For Roanoke, Virginia . . .

(*Continued from page* 38)

In charge of the local office will be J. C. Holmes, veteran Frigidaire sales executive. Mr. Holmes is a former Roanoke resident, and was for several years associated with the Frigidaire distributorship here as general manager. More recently he has been commercial sales manager with the Norfolk, Virginia, Frigidaire district office.

The Next Great Profit Appliance . . . . .

(*Continued from page* 10)

lars a year in promotion. Today, we are all reaping the benefits of that investment.

One reason why electric ranges have not been sold in larger volume before is that too few women have known about electric cookery and electric ranges. That is a condition we are rapidly changing. You can look into women's magazines, and find more electric range articles because women want to know more about electric cookery.

And look at advertising—until recently, refrigerator manufacturers spent ten times as much money in advertising as electric range companies. Even the gas range was outstripping the electric range in advertising. Gas associations spent a million and a half in three years promoting gas ranges. But now the electric range has an increased advertising budget to back it up.

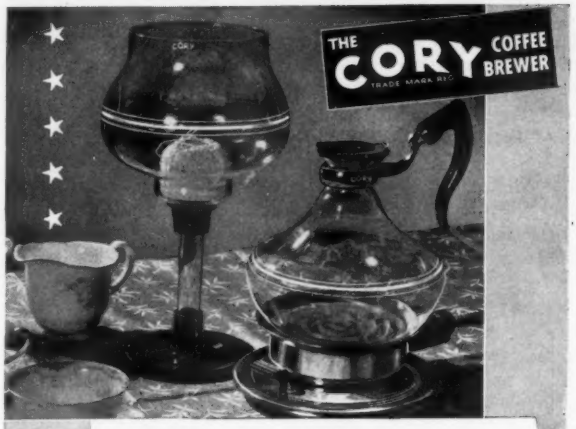
Electric ranges now can go into the profit period—a profit period for the distributor, the dealer, the utility, and the salesman. Electric range prices are still large enough for adequate promotion. We can not do this job now but if we let things drag along, competition will force down range prices leaving no margin for the sales promotion necessary to build high volume sales.

Look at the bar-shaped diagram, broken up to represent the theoretical make up of retail prices. It shows manufacturer's cost and profit; margin for promotion and

WRITE
for information on . . . . .

☐ Time Switches ☐ Program Time Switches ☐ Fire Drill Signal
☐ Process Timers ☐ Photo Engraving Timer ☐ Defrosting Switches
☐ Interval Timers ☐ Motor Reverser Switch ☐ Heating Plant Controls
☐ Flashers (All Types) ☐ Delayed Action Relays ☐ Linotype Time Switches

Automatic Electric Mfg. Co., Mankato, Minnesota



Delicious Coffee Always —Smartly Served!

A new conception of speed, beauty and convenience in the brewing and serving of perfect coffee.

Always sold complete. No extras to buy. The price includes all these patented and exclusive features.

- "Fast-Flo" Filter
- Bakelite Funnel Holder
- Hinged Decanter Cover
- Formed Pouring Lip
- Easy Grip Handle
- 2-Heat Electric Units (Hi-Low)
- Heat-Resisting Glass by CORNING
- Bakelite Coffee Measure
- Beautiful Platinum Decoration

Latest catalog showing complete line gladly mailed.

Glass Coffee Brewer Corp.
325 North Wells Street Chicago, Illinois

Any Repair Shop

Can make Money with

BROWNING Coil Winding *and* Spreading Equipment

There is nothing to stop you from making money if your shop is equipped with Browning Coil making equipment—Makes your shop modern—allows you to handle the big profit jobs—speeds up your production and helps you to show a bigger net profit.

THE BROWNING LINE INCLUDES:

Loop and Field Winder, 9 Speed Heavy Duty Type; Combination Loop Field and Transformer Winder, Universal Diamond Coil Winder; Coil Spreader, 30, 42, 60, 84 inch Loop capacity; Reel Rack and Tension Devices; Winding and Banding Machine.

Write Today for Information about any item.

POTTER & RAYFIELD, INC.
Manufacturers of Browning Coil Equipment
Hemphill Ave., Atlanta, Ga.

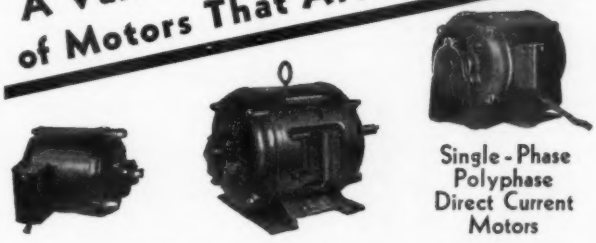
Wagner Motors *Are* Appliance Sales Boosters

as well as being profitable items to sell

Electrical dealers and contractors can profit by handling a well-known, dependable and complete line of both fractional- and integral-horsepower motors. Millions of homes have Wagner-motored refrigerators, oil burners, coal stokers and other appliances giving satisfactory service to their owners. Wagner motors have wide customer acceptance, which means that it will require less sales effort on your part to sell Wagner motors and Wagner-motored appliances.

In addition, whenever you recommend Wagner motors to your customers, you can give them an absolute assurance that they are guaranteed and will give satisfactory service and trouble-free operation.

Wagner Motors Are Available in A Variety of Sizes and Types of Motors That Are In Demand



Single-Phase Polyphase Direct Current Motors

Wagner motors are available in a large variety of sizes and electrical types of single-phase, polyphase and direct current motors that are widely used on all types of household appliances, industrial and commercial installations. Wagner motors embody the latest refinements in design and manufacture. They can be varied mechanically to suit the requirements of the job. Wagner factory branches located in the principal cities assure convenient and quick service for all your motor needs.

MM138-1AA

Wagner Motors Are Worth Investigating

Send for Catalog today!

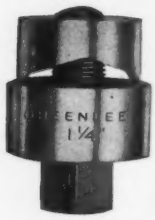
Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.

MOTORS TRANSFORMERS FANS

SAVE Time and Money with Greenlee Tools

Hydraulic Conduit Benders

Greenlee Hydraulic Benders are time and money savers, because they bend conduit quicker and easier than by other methods. In addition, they make smooth, even bends, eliminating many fittings and making it easy to pull in wire and cable. They are simple to operate and are readily portable.



Knockout Tools

Greenlee Knockout Punches and Cutters are time savers and profit makers, because they make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without reaming or filing.

Other Greenlee Tools

Hydraulic Pipe Pushers
Joist Borers — Bit Extensions
Electricians' Bits

Let us send Complete Information.

GREENLEE TOOL CO.
1707 Columbia Ave.
ROCKFORD, ILLINOIS

GREENLEE TOOL CO., 1707 Columbia Ave. Rockford, Illinois
Please send complete information on:
☐ Knockout Tools ☐ Conduit Benders

Name _____
Street _____
City _____
State _____
My Jobber is _____ ES-9-38

advertising; the distributor's margin; and the retailer's margin. No matter what the appliance, competition eventually forces down a high retail price to a lower retail price leaving no margin for adequate sales promotion.

The electric range industry has wisely determined to follow the lead of refrigerator manufacturers. You will recall that in years when refrigerator prices were still high, we put over the biggest refrigerator drives.

In other words, the refrigerator industry invested money at the proper time to put over the refrigerator, and by doing so, have kept the sales curve up.

Let us examine the conditions in another industry that did not adopt this aggressive policy. Consider the ironing machine. The ironing machine is one appliance that completely "missed the boat." Sales came along nicely from 1921 to 1926. At that time, some sales promotion should have been applied, advertising ironing machines. Unfortunately, that pressure was not exerted, and last year, sales of ironers were not much greater than they were in 1929. But during the period of 1921 to 1937 the retail price of ironers was coasting down from $150 in 1921 to $70 last year. Now it may be too late to apply advertising pressure behind the ironing machine.

The electric range industry today does not want to "miss the boat." They are determined, with this new campaign by Modern Kitchen Bureau and all the individual advertising and sales pressure of manufacturers to put over the electric range, to make it a profit item for manufacturer, distributor, retailer, and utility.

Building for the Future In Residential Sales . .

(Continued from page 6)

promoting, money-saving appliance?

Leading manufacturers state their refrigerators have attained a degree of mechanical perfection that should make their useful life 15 years or more. What an opportunity awaits a proper finance plan—one that will put refrigerators in 4 million homes, double the annual utility revenue from these homes, save money for the consumer and give us an added load of a billion and a half kilowatt hours annually with a wonderful load factor.

And while we are on the subject of load factors, let me point to the fallacy behind the efforts many companies have made in trying to push electric range sales alone. Lured by the vision of high annual consumption they forgot that demon, low load factor, and soon found themselves selling a lot more kilowatt hours for no more money. Not only was this power sold in the low rate blocks but the demand increased to the extent of requiring additional plant.

Even the off-peak water heater alone is bad. It loses its economic value to the operating company because it uses current at such low rates. The only answer to these appliances is a combination of the two. According to a study made by Constantine Bary of the Philadelphia Electric Company, the best combination from a company point of view is a ratio of two ranges to one off-peak, time-controlled water heater.

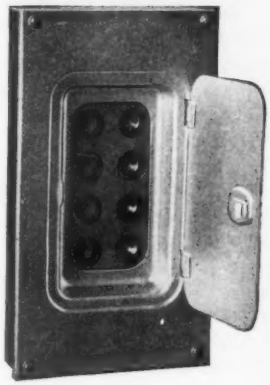
However, my feeling is that we have another important thing to consider if we are going to build

The Atmosphere of an Exclusive Club
and yet over 50% of all rooms for $3.50 or less single; $5.00 or less double.
hotel Mayfair
ST. LOUIS

"You get smooth service here
Right at St. Louis' hub,
In the friendly atmosphere
Of a private home or club."
HOTEL
Lennox
SAINT LOUIS
OVER 50% OF ALL ROOMS $3.50 OR LESS, SINGLE; $5.00 OR LESS, DOUBLE

WHO SAID IT COULDN'T BE DONE

Better?



8 Circuit
FUSE GROUP
Surface Type

Yes! Who said that Service Entrance Panels couldn't be built better without a big increase in price? We said it once, and so did lots of others. But we were all badly mistaken for it has been done, and in a big way, by our engineers. The demand for Walker Electrical Company quality products has permitted us to re-design our line of fuse groups.

This new quality fuse group surpasses anything on the market. It has every desirable feature without a single undesirable one—every detail has been worked out to perfection. The design is so attractive and compact it can be placed anywhere to add a touch of decorative beauty to the job. Bring your wiring jobs up-to-date with WALKER quality products. Our price is right.

WECO ATLANTA

6 Circuit
FUSE GROUP
Flush Type
—
Write today
for Complete
Information

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ATLANTA, GEORGIA

Master-Light Type "T"
Mounts On Repair Car Roof

"Just Point The Pistol Handle"

A Rugged Searchlight for Trucks and Repair Cars. Finished in black enamel and chromium plate.

ONLY SPOTLIGHT MADE ESPECIALLY FOR PUBLIC UTILITIES

Write today for information regarding complete line of Carpenter Master-Lights.

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CHROMALOX SUPER-SPEED RANGE UNITS

Everywhere they are popularizing electric cooking

with new speed, economy, cleanliness, convenience, and longer service life. For dealers and utilities they cut servicing costs to the bone. Ideal for replacement.

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for

Window Lighting, Signs, Heating, Ventilating and Air Conditioning.

Portable Models for Radios and Cookers

$9.75 and up

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88 Pryor St., S. W. Atlanta, Ga.

The Tork Clock Co., Inc., Mount Vernon, New York

C. B. ROGERS

ELECTRICAL HEATING ENGINEER
CHROMALOX
ELECTRICAL HEATING UNITS
and
CHROMALOX
EQUIPPED PRODUCTS

1000 PEACHTREE STREET
ATLANTA, GEORGIA

soundly for the future; if we are really going to develop the full potential value there is today and for tomorrow among the unsold, the low use, the low income group of customers.

Some companies I know have discovered the way to do just that. They have in effect a plan called the "District Representative Plan." It is doing the trick and making satisfied customers in the bargain, customers that believe in the electric company not as a necessary evil but as a real public utility in the true sense of the word, working for their benefit and one they want to see prosper.

Let me cite a few of the things the district representative plan has accomplished in one company. This company's annual residential and small commercial sales amounted to one and a quarter million dollars in 1936. The district representative plan was put into effect in the early part of that year.

By December 1937, revenue had increased 7½%; bill delinquencies of 30 days dropped from 30% to 8.5%; charge-offs for the year dropped from $11,000 to $3,200; disconnects for nonpayment decreased from 431 in April, 1936, to 19 in December, 1937, 13 of which were reconnected the same week; sales leads turned in jumped from 545 in 1936 to 821 in 1937; and sales resulting from these leads increased from 15.5% to 25.9%.

That is building for the future in residential sales. The district representative has first hand knowledge of the conditions under which his customers live. He knows their personal habits, the appliances they own, and their financial standing. He makes minor service repairs, so annoying to the customer. There is assurance of better understanding between the consumer and the company.

Eliminate Complaints

Building for the future requires building sound public relations and sound public relations demands the elimination of complaints. If you want to keep your business; if you want your business to grow; if you want public opinion to rise above the specious twaddle that is handed out today in favor of public ownership—get rid of all complaints. Don't be like one large company I know of that crowed because an analysis of consumer complaints showed 71% not traceable to utility service faults.

To me it makes no difference what the percentage is. The number of complaints is the important thing and, if there is any difference, I say we are better off if the complaints are due to our own errors, which we can admit and eliminate, than if they are due to consumer misunderstanding.

Don't you realize the far-reaching effect of any failure on the part of the public to comprehend our efforts and our motives? It is that pitiful lack of understanding that makes them criticize *us*, as operating men, because somebody made fifty million dollars in 1929 through the sale of holding company stock. And they think they are still paying for it today in excessive rates. That's why I say, don't stop even for a moment in your efforts to increase public understanding of the good job you are doing.

We know that residential sales are the most important hope we have for the future stability of our industry. If we are to build soundly for the future in residential sales,

1. We must hold our present revenue against load mortality due to progress in the industry.

2. We must find our market for expansion of service among the unsold, the low-use-customers of today and the new building developments of tomorrow.

3. We must develop our market with careful attention to the load factors involved lest we find ourselves in the anomalous position of having increased our kilowatt hour output at a loss in dollars of net due to excessive investment requirements.

4. We must hold our market by selling the use, not just the appliance, by the development of sound public relations built on our own intimate understanding of the public's needs, and the public's appreciation of us.

ELECTRICAL ESTIMATE BLANKS

(fine for estimating on FHA jobs), Time Sheets, Job Tickets, and other useful printed forms for Electricians our specialty. Reasonable prices which include delivery. Prompt attention to inquiries and orders. Write for free samples.

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SEPCO
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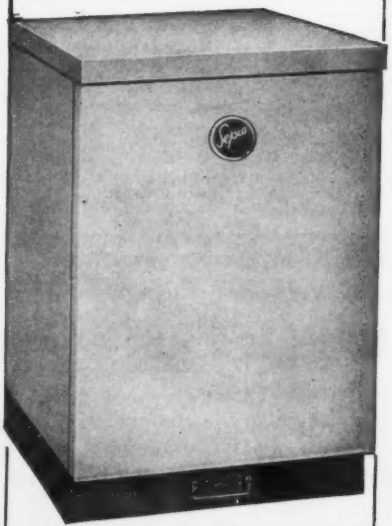


with Porcelain FRONT as well as TOP—to permanently match other kitchen appliances.

AUTOMATIC ELECTRIC HEATER CO., Inc.

Pottstown, Pa.

Southern Division Headquarters:

P. O. Box 1707. Birmingham, Ala.

DOWNTOWN ST. LOUIS
AT YOUR DOORSTEP
350 modern rooms and suites and 3 smart restaurants at your service. Over 50% of all rooms rent for $3.50 or less single; $5.00 or less double.
Hotel Mayfair
ST. LOUIS

"Rest your dogs and save your sox,
There's no need for walking blocks,
Spending money, time and pep—
Here's Downtown at your doorstep."

HOTEL Lennox

SAINT LOUIS

OVER 50% OF ALL ROOMS $3.50 OR LESS, SINGLE; $5.00 OR LESS, DOUBLE

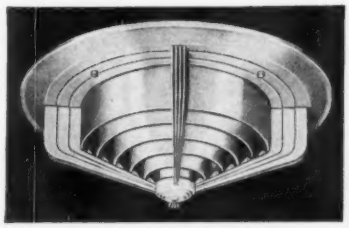
Right in your Block

How Many Stores Need

Sterling Lite-Flo Reflectors and STER-LITE FIXTURES?

Why not find out? Just walk down the street this evening and observe the stores with obsolete show window or interior lighting.

Whether it is a new store, a remodeled store, or a poorly lighted store, Sterling Lite-Flo Reflectors and STER-LITE Louver - Controlled Direct Lighting Units offer PLUS LIGHTING VALUE that wins wiring contracts.



Write for the NEW Sterling Catalog

Stafford L. Jones, District Representative, 2809 Canton St., Dallas. Carries stock.

STERLING REFLECTOR CO.
1431 West Hubbard Street, CHICAGO

Toastswell *Is SMASHING ALL SALES RECORDS with the NEW MATCHED TOASTSWELL LINE!*

● Dealers everywhere are voicing their enthusiastic approval of this new, modern line of fast selling, long profit electrical merchandise by placing their orders now—conclusive proof that 1938 will be another banner Toastswell year!

You'll be enthusiastic too when you see the smart, new combination automatic sandwich toaster and the stunning new automatic waffle baker that perfectly match the now famous, ultra-modern Toastswell automatic two-slice and four-slice bread toasters, which have increased dealer's sales beyond their greatest expectations.

● TOASTSWELL
2 SLICE AUTOMATIC TOASTER $10.95

Equipped with Time Master Control that assures uniform toast at all times, and low heat features that keeps toast hot and makes delicious melba toast.

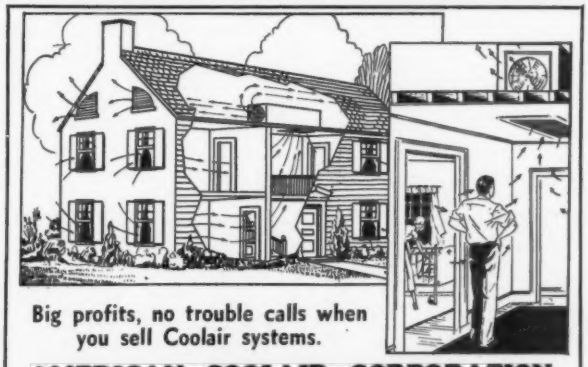
Non-automatic toasters and tray sets also available.

TOASTSWELL
4 SLICE AUTOMATIC TOASTER $15.00

Toasts four slices of bread on both sides at one time. Same mechanical features as two-slice toaster. Non-automatic toasters and tray sets also available.

WRITE TODAY for complete information on the new matched Toastswell line. You'll be sure to want to share in the extra profits that will be yours with Toastswell.

UTILITY ELECTRIC CO.
620 Tower Grove Ave., St. Louis, Mo.



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Jacksonville, Fla.

HERE'S
YOUR HOTEL
in Cleveland
There's a big, outside room—with private bath and circulating ice water—set aside for you. You'll like the delicious meals served in our four restaurants. You're right in the center of things, too. The leading stores, theatres, office buildings, and Union Depot, are all located within a five block radius of the Carter.
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Single: $2.75 to $6.00
Double: $4.00 to $8.00
600 ROOMS
HOTEL CARTER
CLEVELAND
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EXTRA SALES FEATURES—the extra features of the Hamilton Beach food mixer give you extra selling points—easier sales.

NATIONALLY ADVERTISED in the Rotogravure Section of Sunday newspapers.

FREE DEALER HELPS—Complete — attractive. Furnished *free on request.*

Order Hamilton Beach food mixers from your Wholesaler. Write us for *free* dealer helps.

HAMILTON BEACH CO., Racine, Wis.
Division of Scovill Manufacturing Co.

HAMILTON BEACH FOOD MIXER

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